FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

OMTRONICS MANUFACTURING LIMITED

Portable Speaker

Model Number: LI-S20128BT

Additional Model: LI-S20131BT、LI-S20134BT、HY-BS11B、BS11-A、BS-11B、BS12-A、BS12-B、BS21-A、BS21-B、BS22-A、BS22-B

FCC ID: 2AIWK-LI-S20128BT

Prepared for : OMTRONICS MANUFACTURING LIMITED
ROOM 301, KAM ON BUILDING, 176A QUEEN'S ROAD,
CENTRAL, HONG KONG

Prepared By : EST Technology Co., Ltd.
San Tun Management Zone, Houjie District, Dongguan, China

Tel: 86-769-83081888-808

Report Number: ESTE-R1606010
Date of Test : May 31,2016~ Jun 12, 2016
Date of Report : Jun 16, 2016

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Test Report Verification

Applicant: **Address:**	OMTRONICS MANUFACTURING LIMITED ROOM 301, KAM ON BUILDING, 176A QUEEN'S ROAD, CENTRAL, HONG KONG
Manufacturer **Address:**	DongGuan MeiZhiZun Eletronics Technology Co.,Ltd No.33,Hehe Road,Xiangxi Vilage,LiaoBu Town,DongGuan,GuangDong
E.U.T:	Portable Speaker
Model Number:	LI-S20128BT
Additional Model:	LI-S20131BT、LI-S20134BT、HY-BS11B、BS11-A、BS-11B、BS12-A、BS12-B、BS21-A、BS21-B、BS22-A、BS22-B Note: The 12 models have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, except the different model name、Trade name and color.
Power Supply:	DC 5V From USB For Charging DC 3.7V From Internal Battery
Test Voltage:	DC 5V From PC input AC 120V/60Hz DC 5V From PC input AC 240V/60Hz DC 3.7V From Internal Battery
Trade Name:	LAXMAX、MEGA、EARISE Serial No.: ------
Date of Receipt:	May 31,2016 Date of Test: May 31,2016~ Jun 12, 2016
Test Specification:	FCC Rules and Regulations Part 15 Subpart C:2016 ANSI C63.10:2013
Test Result:	The device described above is tested by EST Technology Co., Ltd.. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. Date: Jun 16, 2016

Prepared by:	Tested by:	Approved by:
Ada / Assistant	Tony.Tang/ Engineer	IcemanHu / Manager

Other Aspects:

None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	Portable Speaker
FCC ID	:	2AIWK-LI-S20128BT
Model Number	:	LI-S20128BT
Operation frequency	:	2402MHz~2480MHz
Number of channel	:	79
Antenna	:	Integral antenna , 0dBi gain
Modulation	:	Bluetooth 2.1 (GFSK, π/4-DQPSK) Note: Due to the firmware to limit, the device only supports the GFSK and π/ 4 - DQPSK mode, does not support 8 - DPSK mode.
Sample Type	:	Prototype production

2. SUMMARY OF TEST

2.1. Summary of test result

Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1)	PASS
20dB Bandwidth	FCC Part 15: 15.247(a)(1)	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1)	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii)	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii)	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d)	PASS
Band Edge Compliance	FCC Part 15: 15.247(d)	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207	PASS
Antenna requirement	FCC Part 15: 15.203	PASS

2.2. Test Facilities

EMC Lab : Certificated by CNAL, CHINA
Registration No.: L5288
Date of registration: December 07, 2015

Certificated by FCC, USA
Registration No.: 989591
Date of registration: November 20, 2013

Certificated by Industry Canada
Registration No.: 9405A-1
Date of registration: December 30, 2015

Certificated by VCCI, Japan
Registration No.: R-3663 & C-4103
Date of registration: July 25, 2011

Certificated by TUV Rheinland, Germany
Registration No.: UA 50195514 0001
Date of registration: January 07, 2011

Certificated by TUV/PS, Shenzhen
Registration No.: SCN1017
Date of registration: January 27, 2011

Certificated by Intertek ETL SEMKO
Registration No.: 2011-RTL-L1-18
Date of registration: April 28, 2011

Certificated by Siemic, Inc.
Registration No.: SLCN021
Date of registration: November 8, 2011

Certificated by Nemko, Hong Kong
Registration No.: 175193
Date of registration: May 4, 2011

Name of Firm : EST Technology Co., Ltd.

Site Location : San Tun Management Zone, Houjie Town, Dongguan, Guangdong, China

2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.54dB
Uncertainty for Radiation Emission test (30MHz-1GHz)	3.62dB
Uncertainty for Radiation Emission test (1GHz to 18GHz)	4.86dB
Uncertainty for radio frequency	7×10-8
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB

Note：This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2.4. Assistant equipment used for test

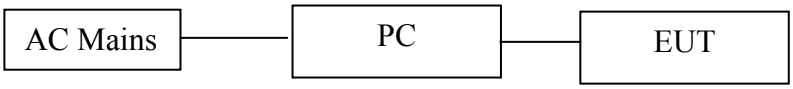
2.4.1. PC

Manufacturer	:	DELL
M/N	:	Laititude E6420
Adapter	:	M/N: DA90PM111 Input: AC 100-240V~50/60Hz 1.5A Output: DC 19.5V/4.62A

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 or 1.5 meter high above ground. EUT was be set into BT test mode by software before test.

For Power Line Conducted Emissions test: EUT was placed on a turn table, which is 0.8 meter high above ground. EUT was be set into BT test mode by software before test and charging mode.



(EUT: Portable Speaker)

2.6. Test mode

The test software was used to control EUT work in Continuous TX mode, and select test channel, wireless mode

Mode	Channel	Frequency
GFSK	Low	2402MHz
	Middle	2441MHz
	High	2480MHz
π /4-DQPSK	Low	2402MHz
	Middle	2441MHz
	High	2480MHz
The EUT Was tested as an indepened unit by using the fully-charged battery		

2.7. Channel List for Bluetooth

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2402	2	2403	3	2404	4	2405
5	2406	6	2407	7	2408	8	2409
9	2410	10	2411	11	2412	12	2413
13	2414	14	2415	15	2416	16	2417
17	2418	18	2419	19	2420	20	2421
21	2422	22	2423	23	2424	24	2425
25	2426	26	2427	27	2428	28	2429
29	2430	30	2431	31	2432	32	2433
33	2434	34	2435	35	2436	36	2437
37	2438	38	2439	39	2440	40	2441
41	2442	42	2443	43	2444	44	2445
45	2446	46	2447	47	2448	48	2449
49	2450	50	2451	51	2452	52	2453
53	2454	54	2455	55	2456	56	2457
57	2458	58	2459	59	2460	60	2461
61	2462	62	2463	63	2464	64	2465
65	2466	66	2467	67	2468	68	2469
69	2470	70	2471	71	2472	72	2473
73	2474	74	2475	75	2476	76	2477
77	2478	78	2479	79	2480	-	-

2.8. Test Equipment

2.8.1. For conducted emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	832354	June,28,15	1 Year
Artificial Mains Networ	Rohde & Schwarz	ENV216	101260	June,28,15	1 Year
Pulse Limiter	Rohde & Schwarz	ESLI-S20128 BT-Z2	101100	June,28,15	1 Year
RF Cable	Fujikura	3D-2W	844 Chamber No.1	June,28,15	1 Year

2.8.2. For radiated emission test(9 kHz-30MHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI	100435	June,29,15	1 Year
Loop Antenna	ETS-LINDGREN	6502	00071730	June,29,15	1 Year
RF Cable	MIYAZAKI	5D-2W	966 Chamber No.1	June,28,15	1 Year

2.8.3. For radiated emission test(30-1000MHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESVS10	100004	June,28,15	1 Year
Spectrum Analyzer	Agilent	E4411B	MY50140697	June,28,15	1 Year
Bilog Antenna	Teseq	CBL 6111D	27090	June,28,15	1 Year
Signal Amplifier	Agilent	310N	187037	June,28,15	1 Year
RF Cable	MIYAZAKI	5D-2W	966 Chamber No.1	June,28,15	1 Year

2.8.4. For radiated emission test(above 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120D1002	June,28,15	1 Year
Board-Band Horn Antenna	SCHWARZBECK	BBHA 9170	9170-497	June,28,15	1 Year
Signal Amplifier	SCHWARZBECK	BBV9718	9718-212	June,28,15	1 Year
Spectrum Analyzer	Agilent	E4408B	MY44211139	June,28,15	1 Year
Spectrum Analyzer	Rohde &Schwarz	FSV	103173	June,28,15	1 Year
RF Cable	Hubersuhner	RG 214/U	513423	June,28,15	1 Year

3. MAXIMUM PEAK OUTPUT POWER

3.1. Limit

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

3.2. Test Procedure

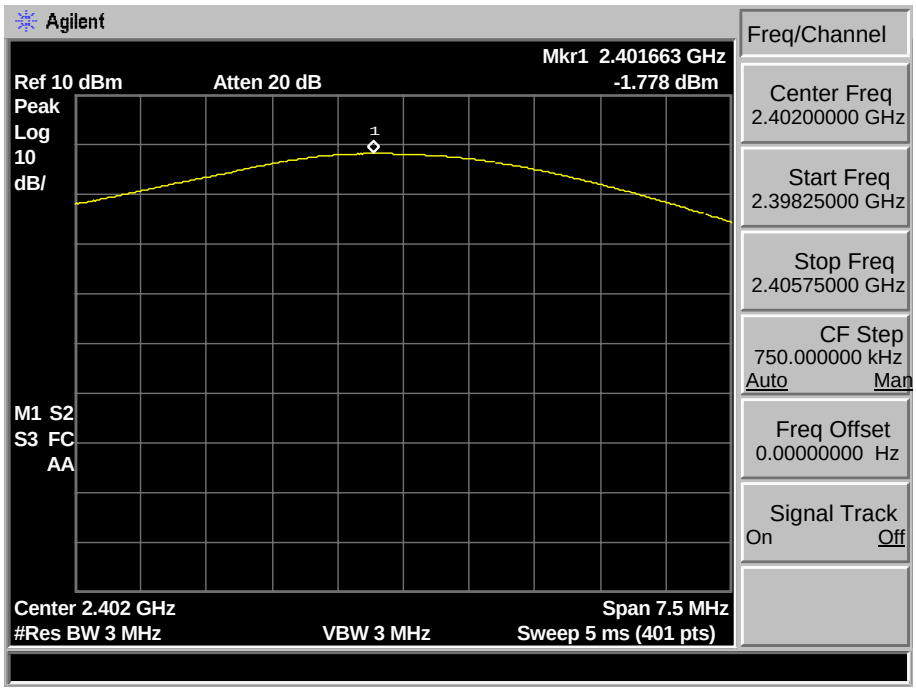
The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.

3.3. Test Result

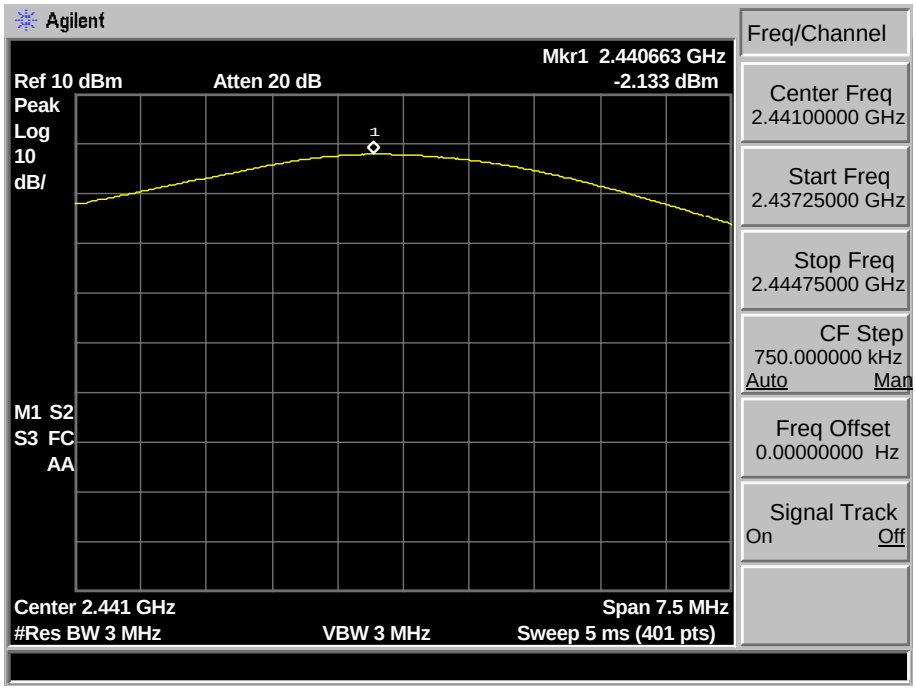
EUT: Portable Speaker M/N: LI-S20128BT					
Test date: 2016-06-10		Test site: RF site	Tested by: Tony Tang		
Mode	Freq (MHz)	Result Peak power (dBm)	Limit		Margin (dB)
			dBm	W	
GFSK	2402	-1.778	30.00	1	31.778
	2441	-2.133	30.00	1	32.133
	2480	-2.976	30.00	1	32.976
π /4-DQPSK	2402	-0.874	21.00	0.125	21.874
	2441	-1.255	21.00	0.125	22.255
	2480	-2.085	21.00	0.125	23.085
Conclusion: PASS					

3.4. Test Data

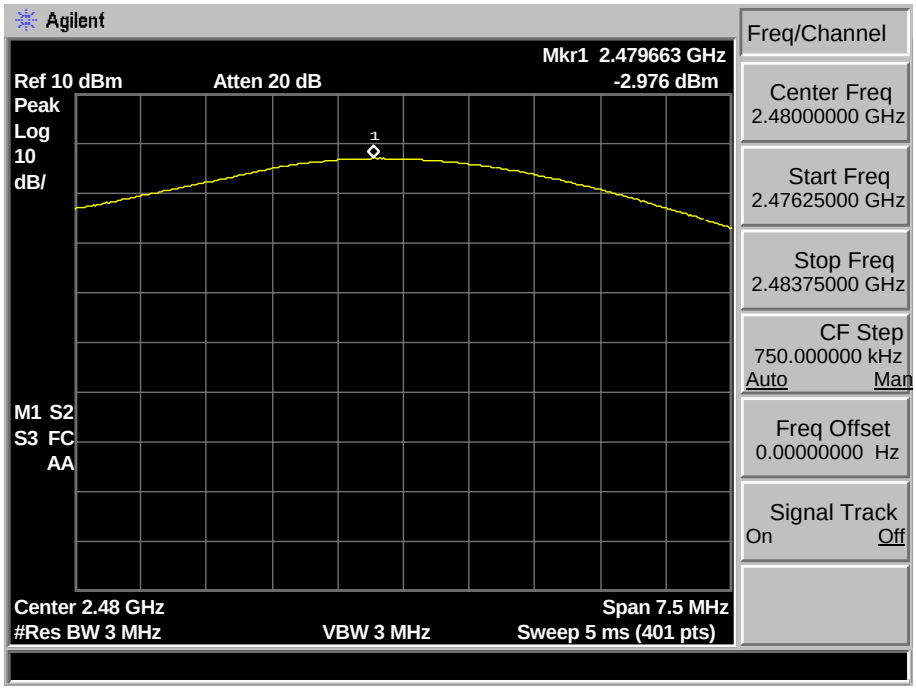
GFSK 2402 MHz



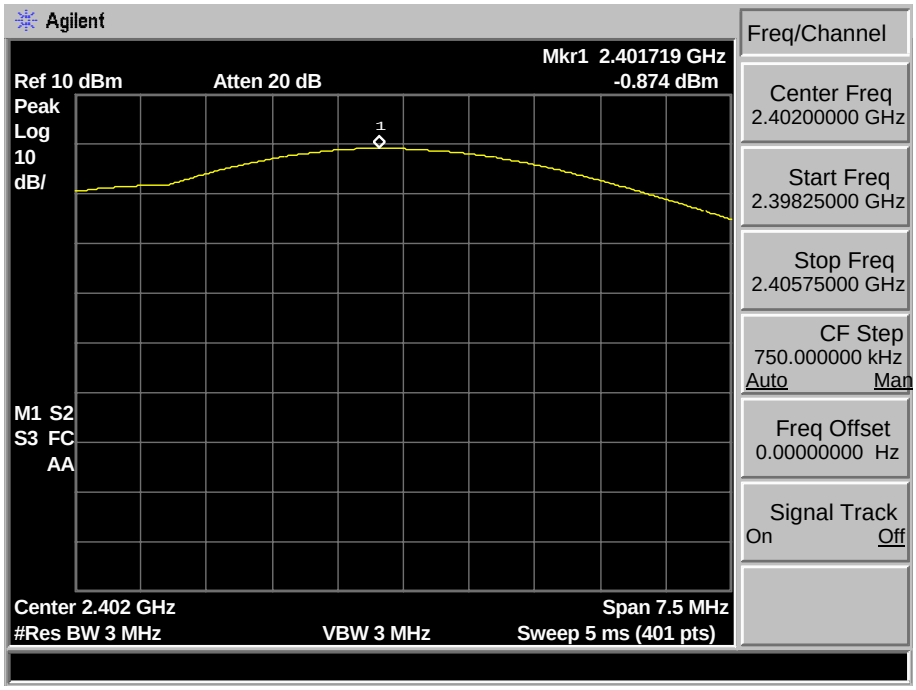
GFSK 2441 MHz



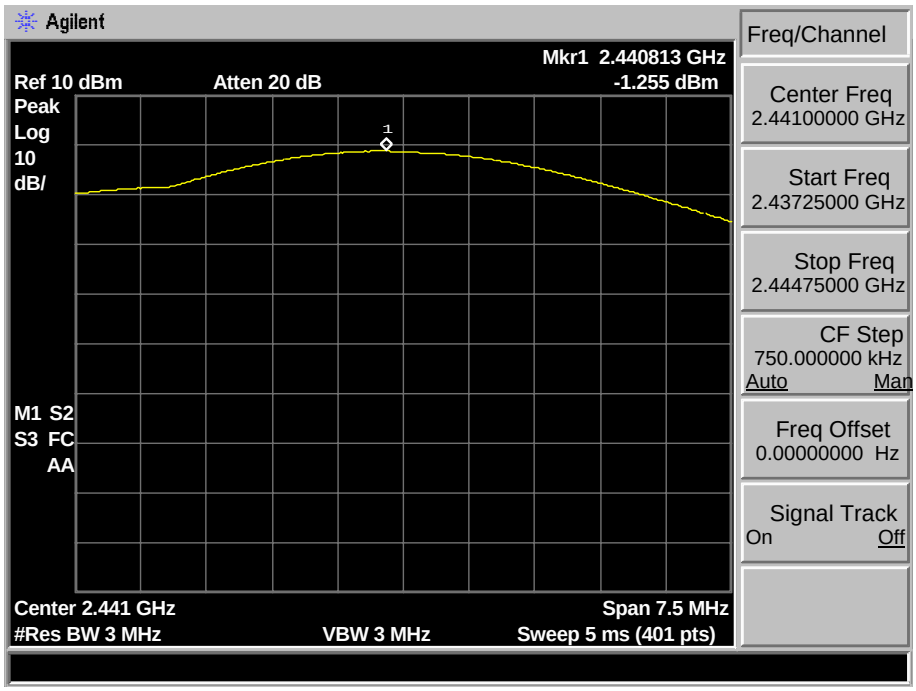
GFSK 2480 MHz



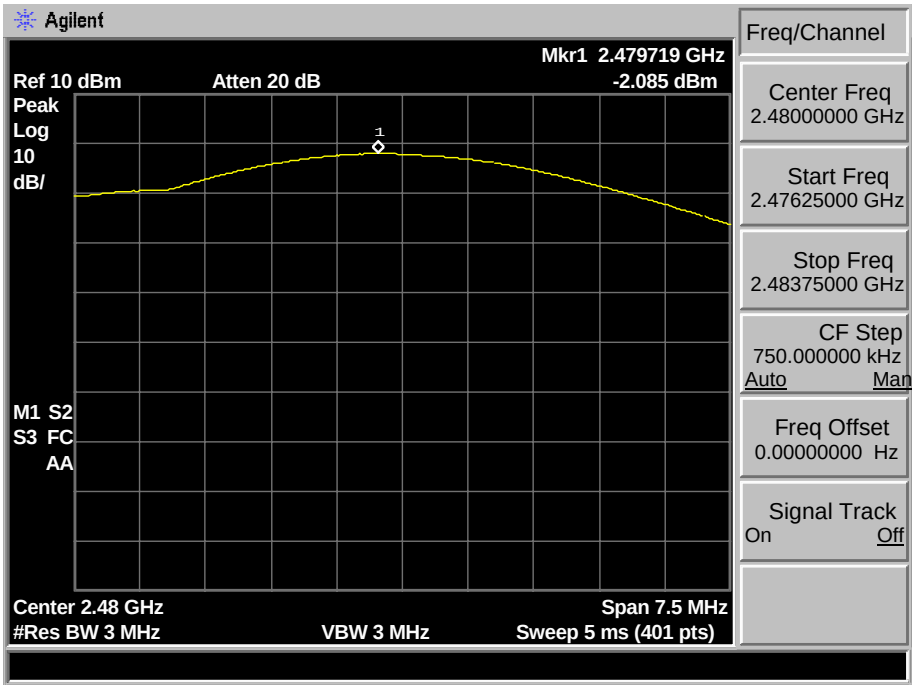
π /4-DQPSK 2402 MHz



π /4-DQPSK 2441 MHz



π /4-DQPSK 2480 MHz



4. 20 DB BANDWIDTH

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.2. Test Procedure

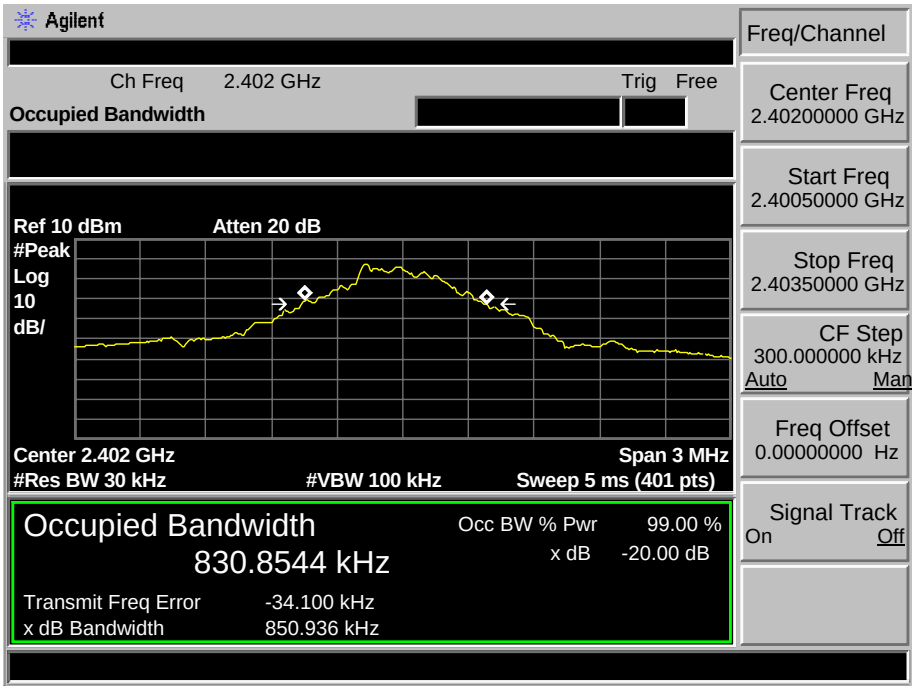
The transmitter output (antenna port) was connected to the spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3. Test Result

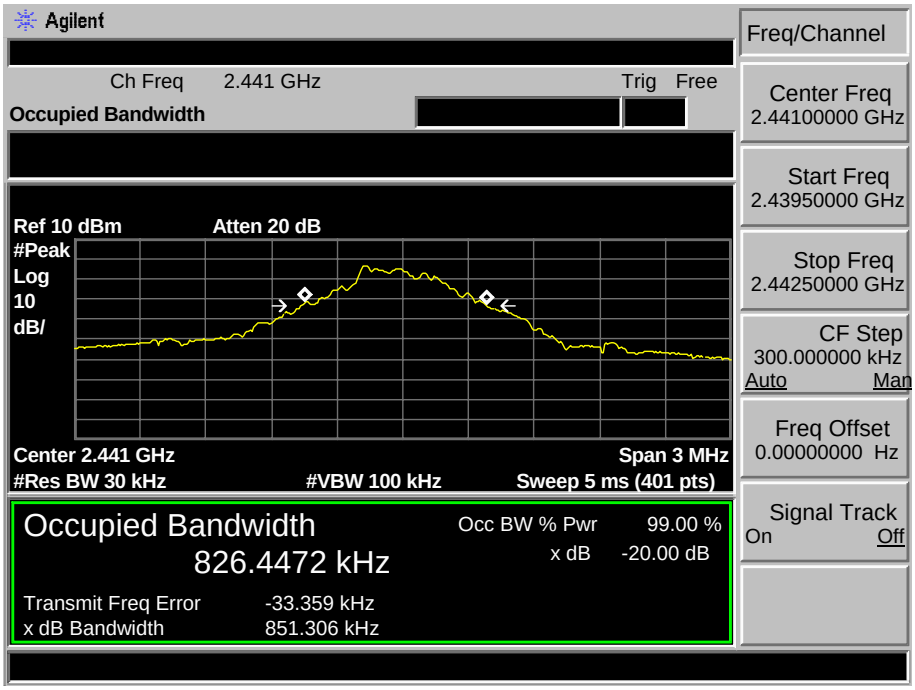
EUT: Portable Speaker M/N: LI-S20128BT				
Test date: 2016-06-10		Test site: RF site		Tested by: Tony Tang
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
GFSK	2402	0.850	/	PASS
	2441	0.851	/	PASS
	2480	0.843	/	PASS
π /4-DQPSK	2402	1.227	/	PASS
	2441	1.226	/	PASS
	2480	1.228	/	PASS

4.4. Test Data

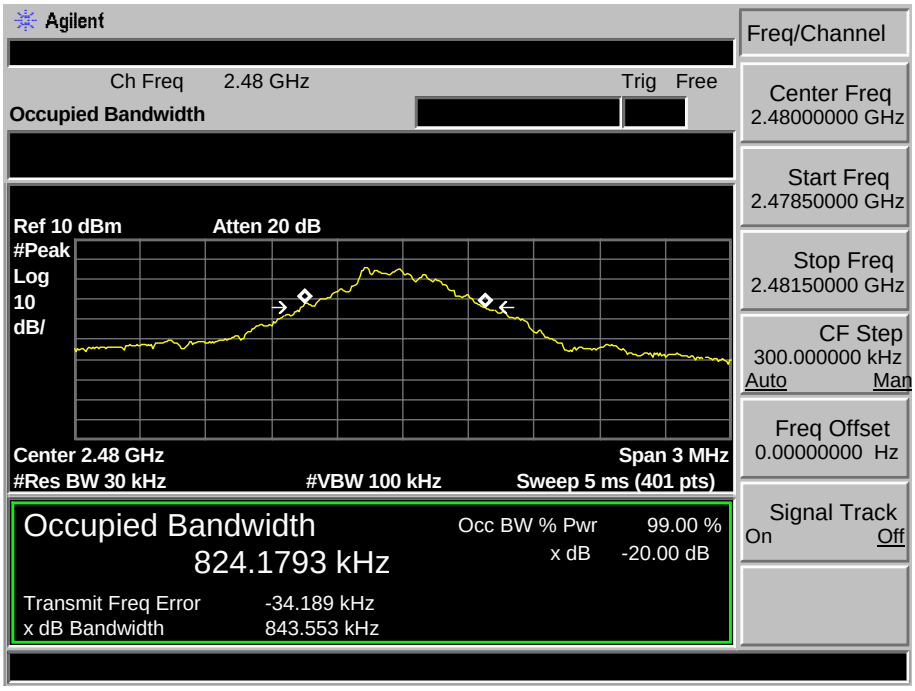
GFSK 2402MHz



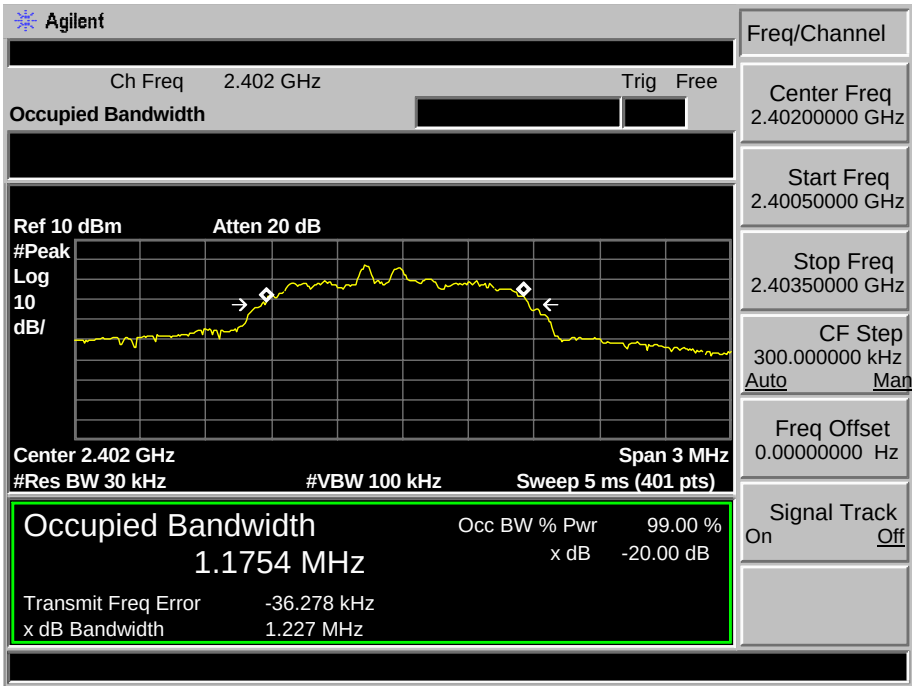
GFSK 2441MHz



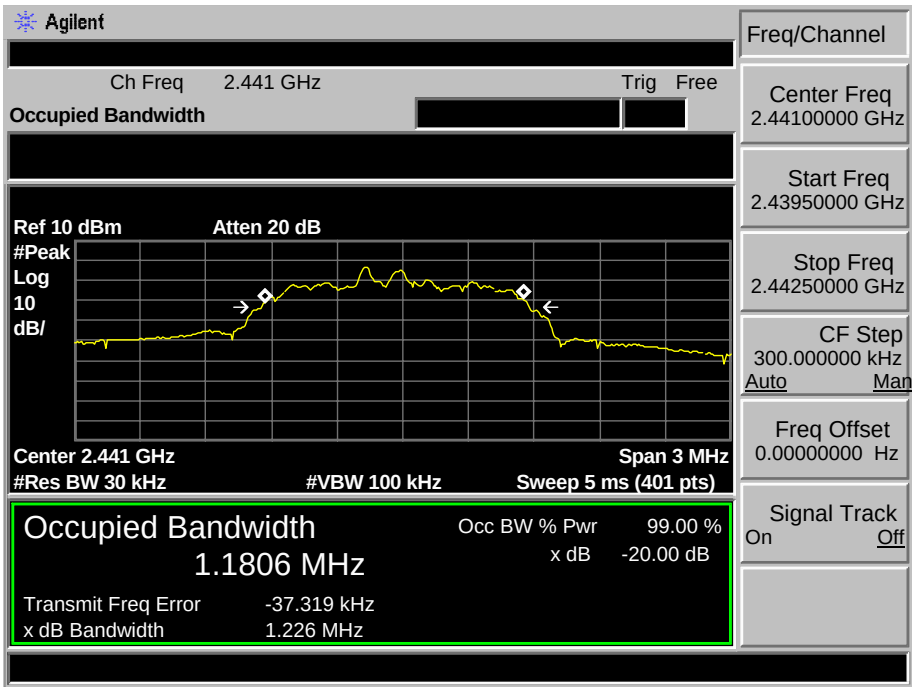
GFSK 2480MHz



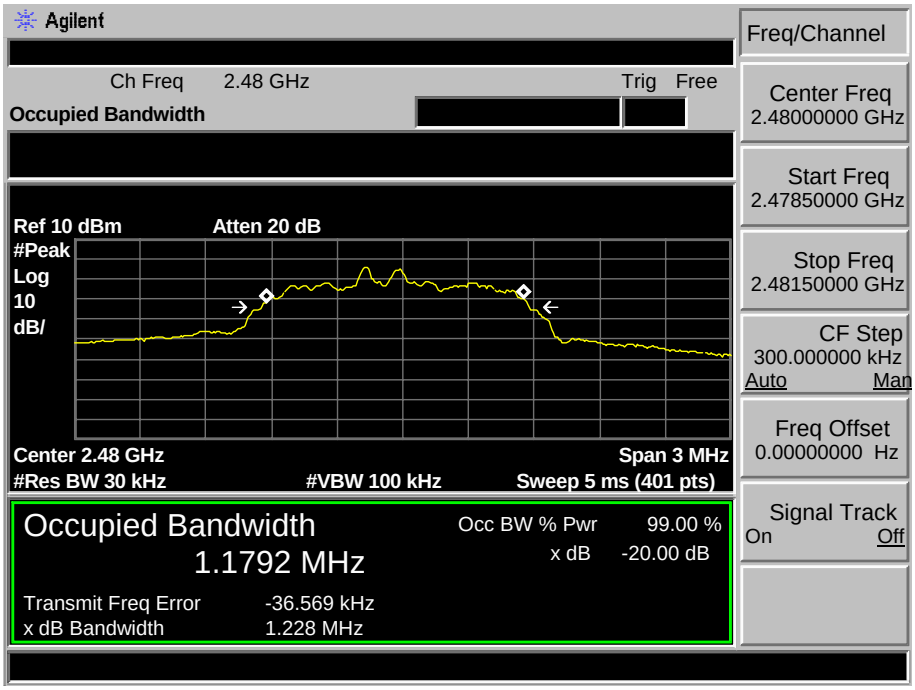
π /4-DQPSK 2402MHz



π /4-DQPSK 2441MHz



π /4-DQPSK 2480MHz



5. CARRIER FREQUENCY SEPARATION

5.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

5.2. Test Procedure

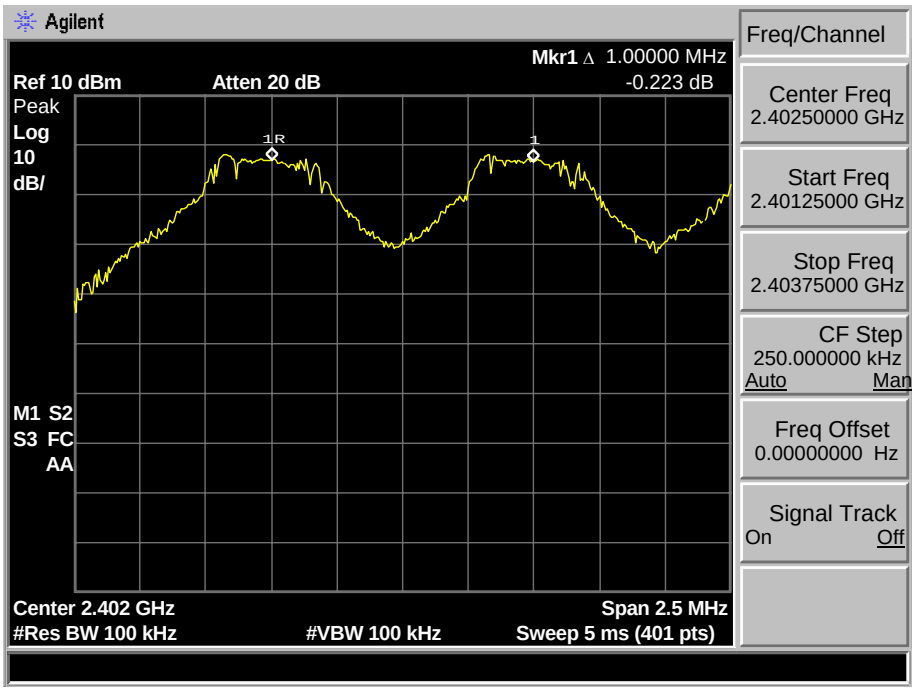
The transmitter output (antenna port) was connected to the spectrum analyzer. The carrier frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW.

5.3. Test Result

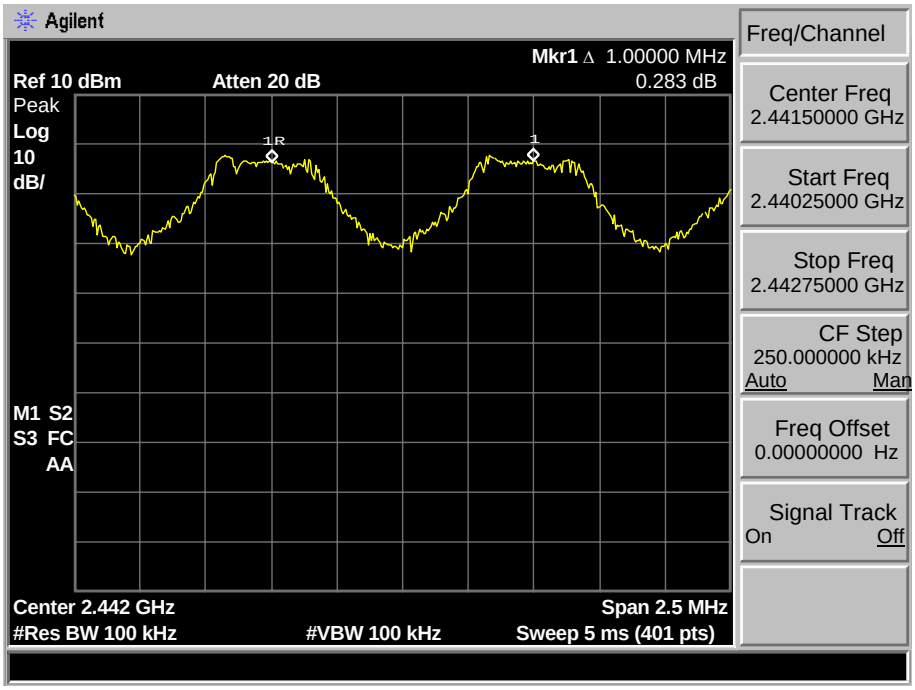
EUT: Portable Speaker M/N: LI-S20128BT				
Test date: 2016-06-10			Test site: RF site Tested by: Tony Tang	
Mode	Channel	Channel separation (MHz)	Limit	Conclusion
GFSK	Low CH	1.000	0.850MHz	PASS
	Mid CH	1.000	0.851MHz	PASS
	High CH	1.000	0.843MHz	PASS
π /4-DQPSK	Low CH	1.000	> 2/3 of the 20dB Bandwidth or 25[kHz](whichever is greater)	PASS
	Mid CH	1.000		PASS
	High CH	1.000		PASS

5.4. Test Data

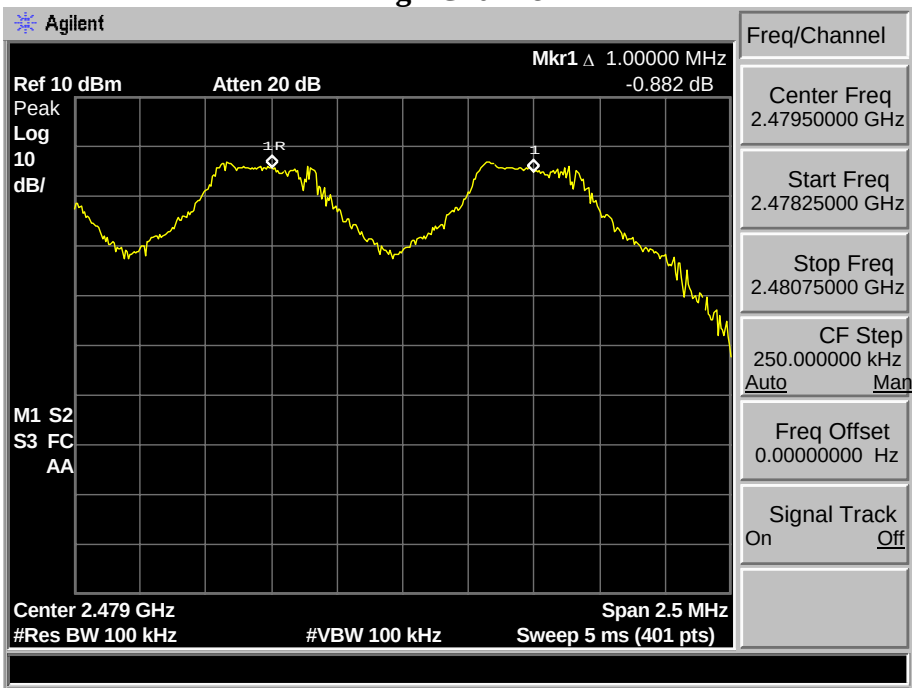
GFSK
Low Channel



Mid Channel

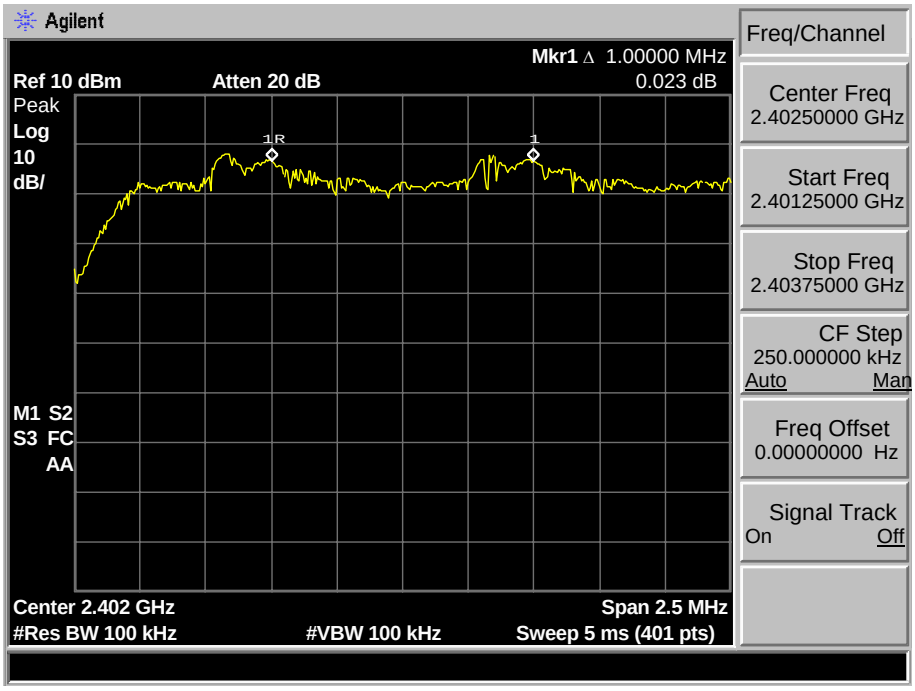


High Channel

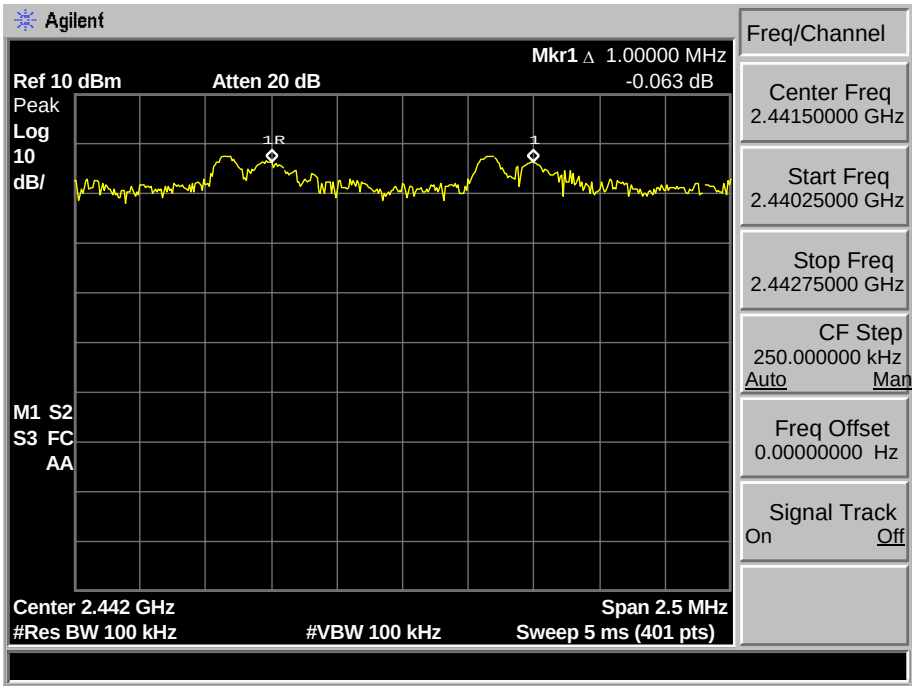


π /4-DQPSK

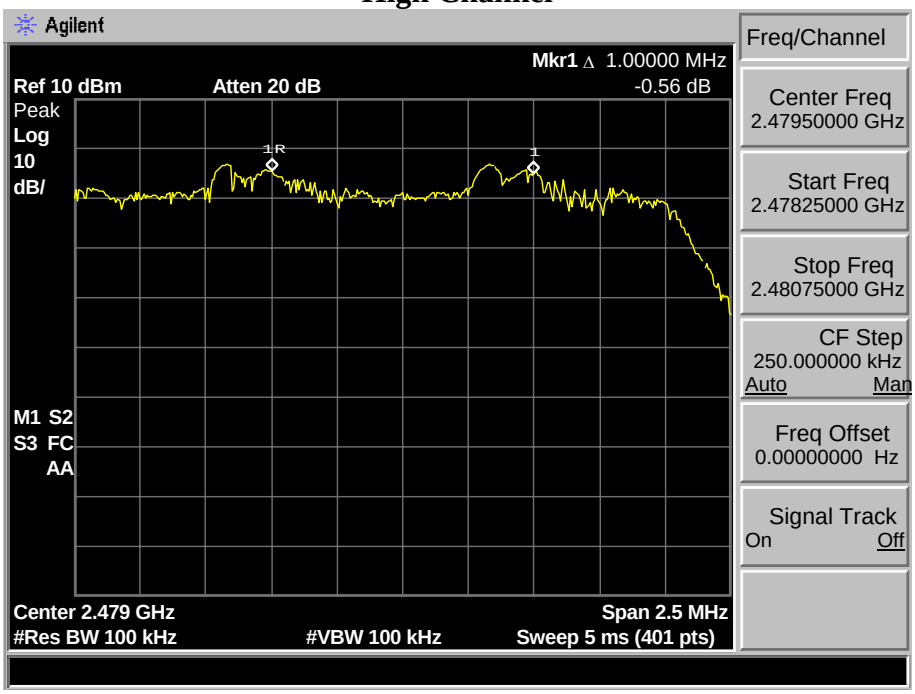
Low Channel



Mid Channel



High Channel



6. NUMBER OF HOPPING CHANNEL

6.1. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

6.2. Test Procedure

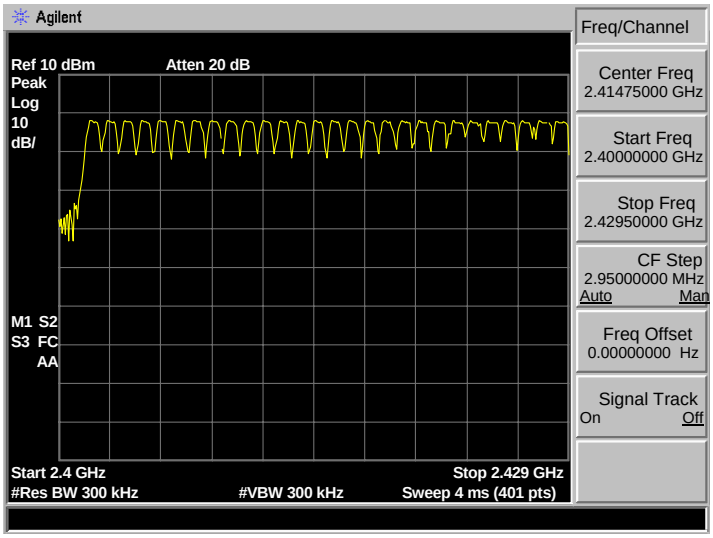
The transmitter output (antenna port) was connected to the spectrum analyzer. The number of hopping channel was measured by spectrum analyzer with 300kHz RBW and 300kHz VBW.

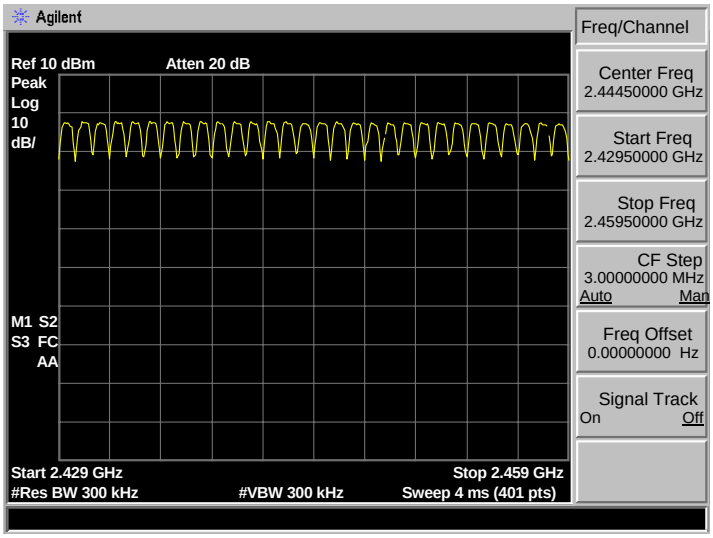
6.3. Test Result

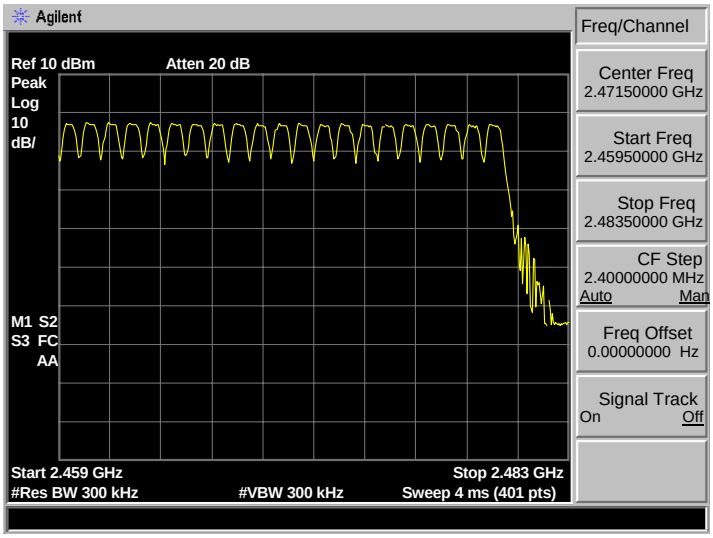
EUT: Portable Speaker M/N: LI-S20128BT			
Test date: 2016-05-10	Test site: RF site	Tested by: Tony.Tang	
Mode	Number of hopping channel	Limit	Conclusion
GFSK	79	>15	PASS
π /4-DQPSK	79	>15	PASS

6.4. Test Data

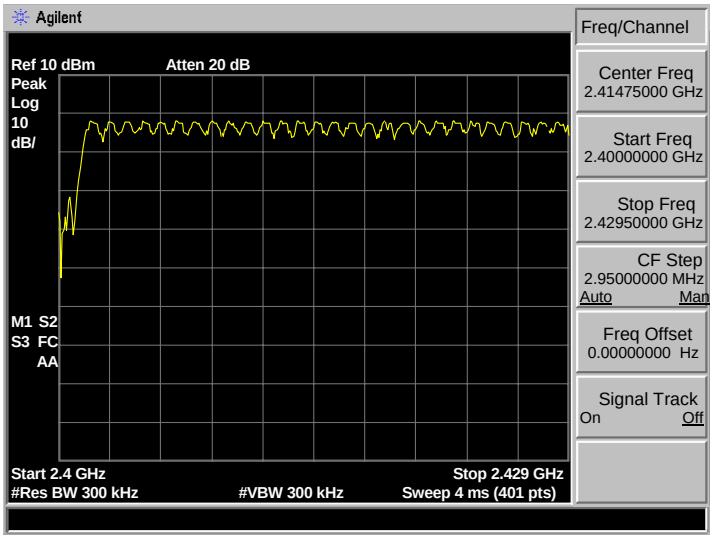
GFSK

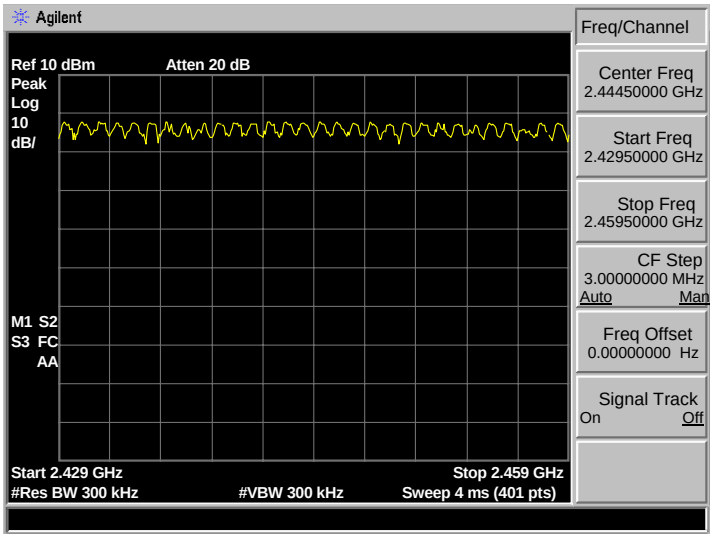


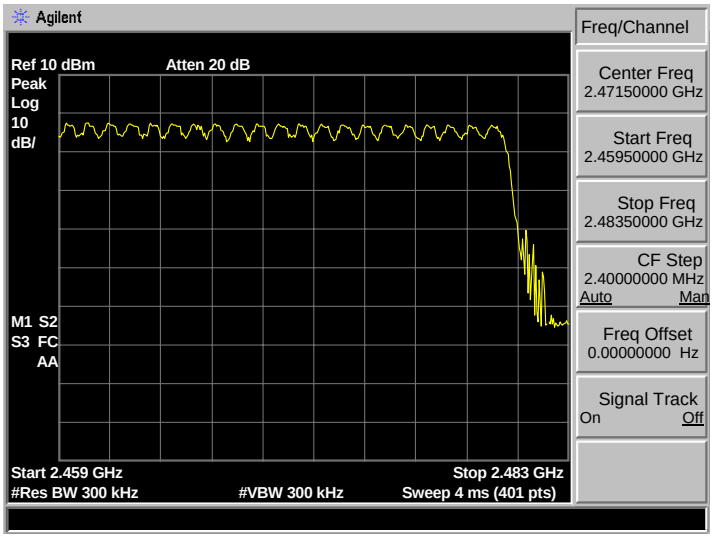




π/4-DQPSK


Agilent
Freq/Channel
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center Freq
2.41475000 GHz
Start Freq
2.40000000 GHz
Stop Freq
2.42950000 GHz
CF Step
2.95000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Start 2.4 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.429 GHz
Sweep 4 ms (401 pts)


Agilent
Freq/Channel
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center Freq
2.44450000 GHz
Start Freq
2.42950000 GHz
Stop Freq
2.45950000 GHz
CF Step
3.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Start 2.429 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.459 GHz
Sweep 4 ms (401 pts)


Agilent
Freq/Channel
Ref 10 dBm
Atten 20 dB
Peak
Log
10
dB/
M1 S2
S3 FC
AA
Center Freq
2.47150000 GHz
Start Freq
2.45950000 GHz
Stop Freq
2.48350000 GHz
CF Step
2.40000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Start 2.459 GHz
#Res BW 300 kHz
#VBW 300 kHz
Stop 2.483 GHz
Sweep 4 ms (401 pts)

7. DWELL TIME

7.1. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

7.2. Test Procedure

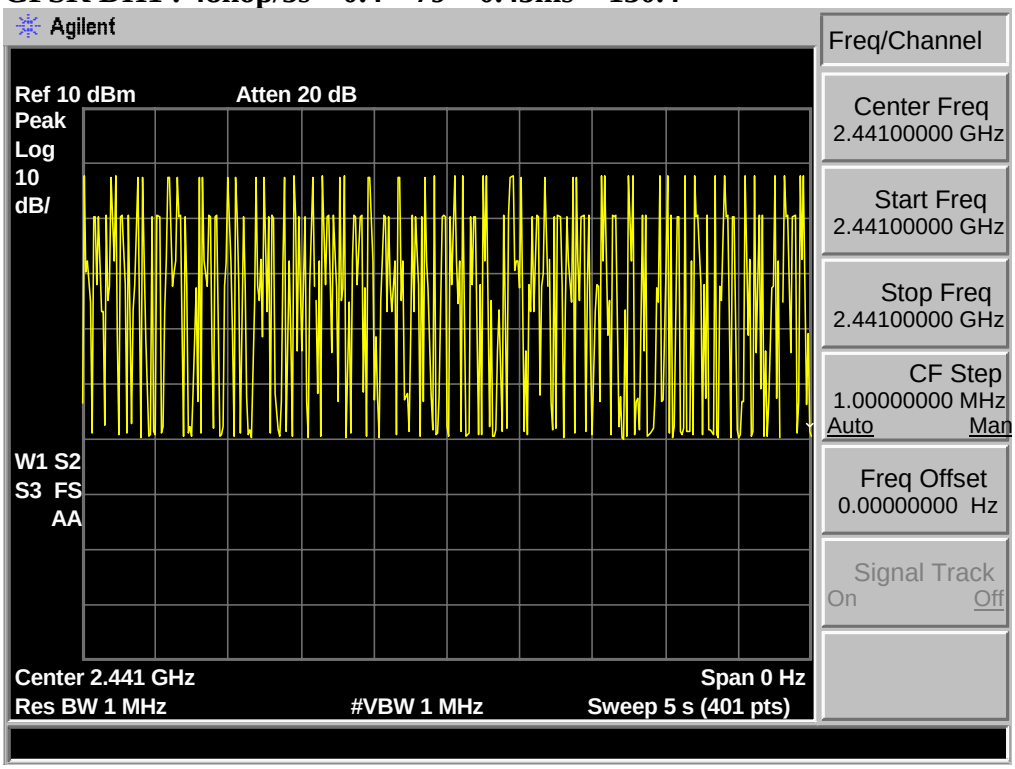
1. The transmitter output (antenna port) was connected to the spectrum analyzer. Connect EUT antenna terminal to the spectrum analyzer with a low loss SMA cable.
2. Set the EUT to proper test mode with relative test software and hardware.
3. Spectrum analyzer setting: Centered Frequency = measured channel, RBW = 1MHz, VBW= 1MHz, Frequency Span = 0 Hz.
4. Set sweep time properly to capture the entire dwell time per hopping channel.
5. Set detector type to Peak and trace mode to Max Hold and make the measurement.
6. Repeat step 3-5 until all channels measured were complete.

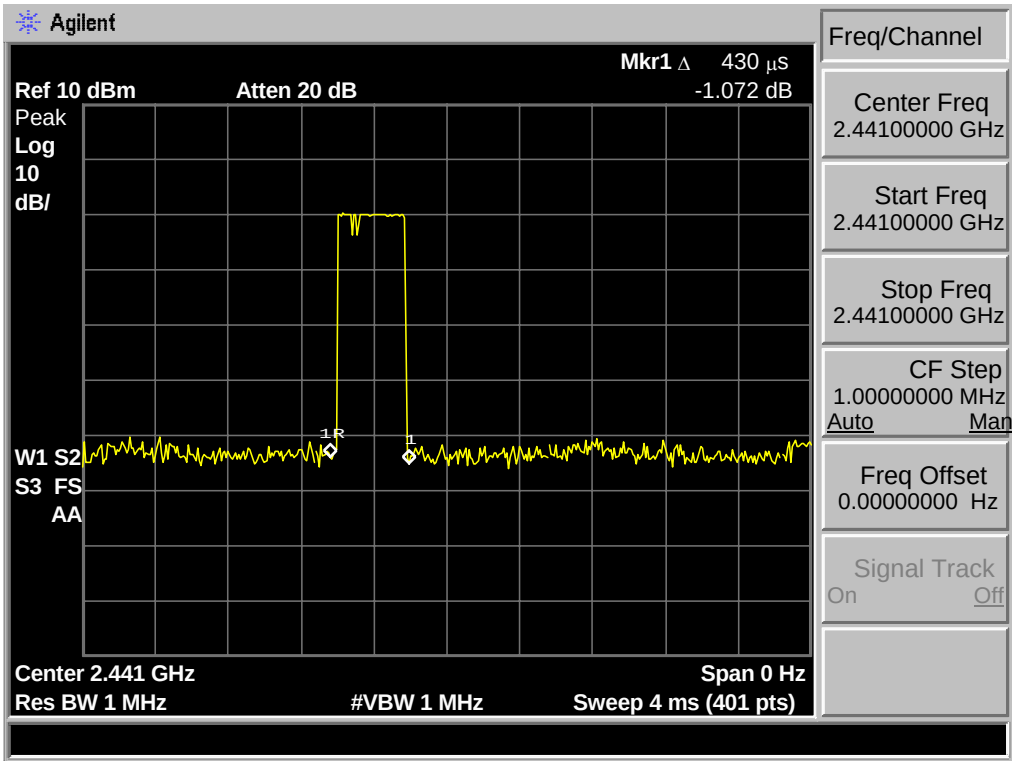
7.3. Test Result

EUT: Portable Speaker M/N: LI-S20128BT			
Test date: 2016-06-10	Test site: RF site	Tested by: Tony Tang	
Mode	Dwell time (ms)	Limit	Conclusion
GFSK DH1	130.4	<400ms	PASS
GFSK DH3	272.8	<400ms	PASS
GFSK DH5	367.8	<400ms	PASS
π /4-DQPSK 3DH1	124.8	<400ms	PASS
π /4-DQPSK 3DH3	263.9	<400ms	PASS
π /4-DQPSK 3DH5	257.5	<400ms	PASS

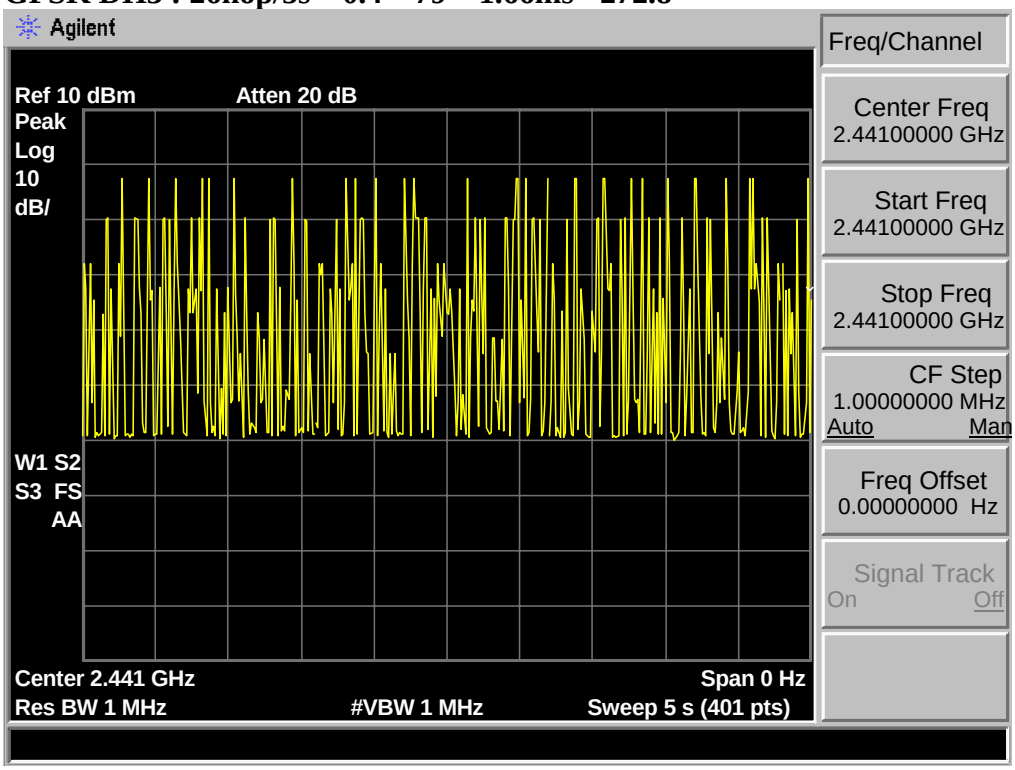
7.4. Test Data

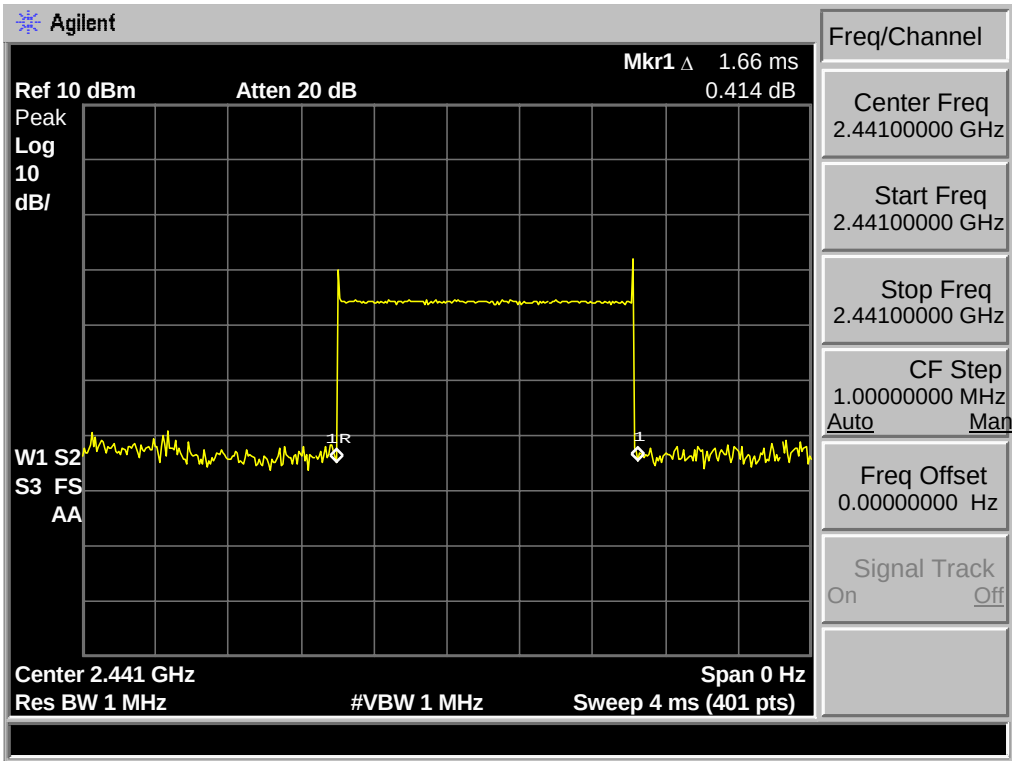
GFSK DH1 : 48hop/5s * 0.4 * 79 * 0.43ms = 130.4



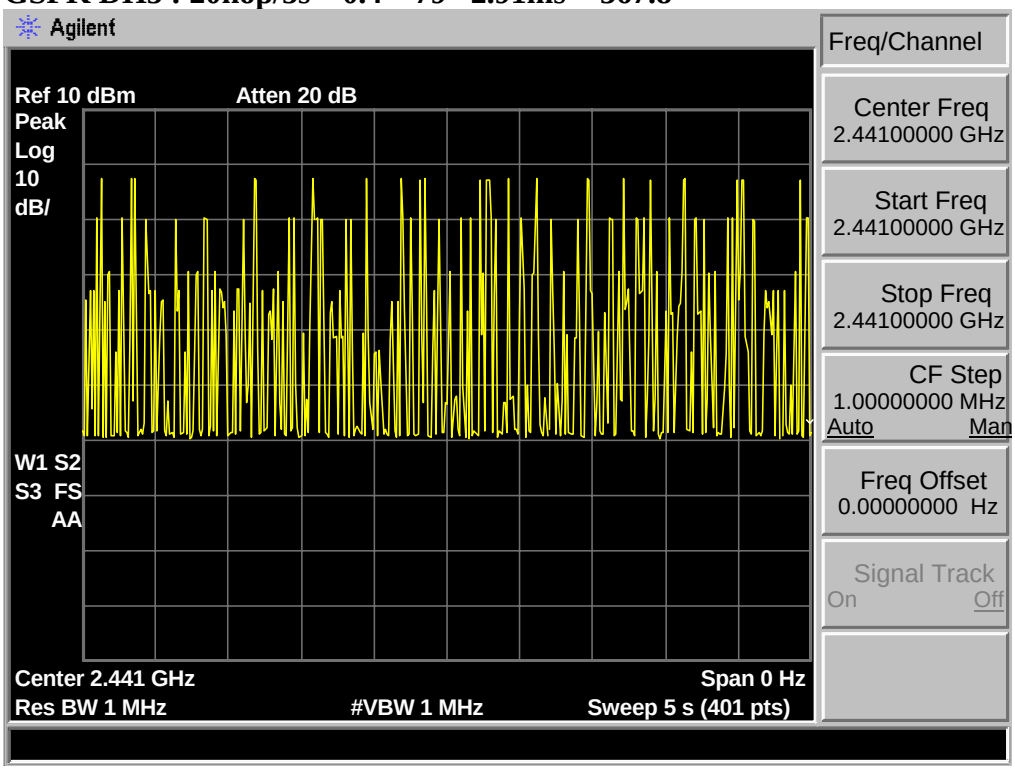


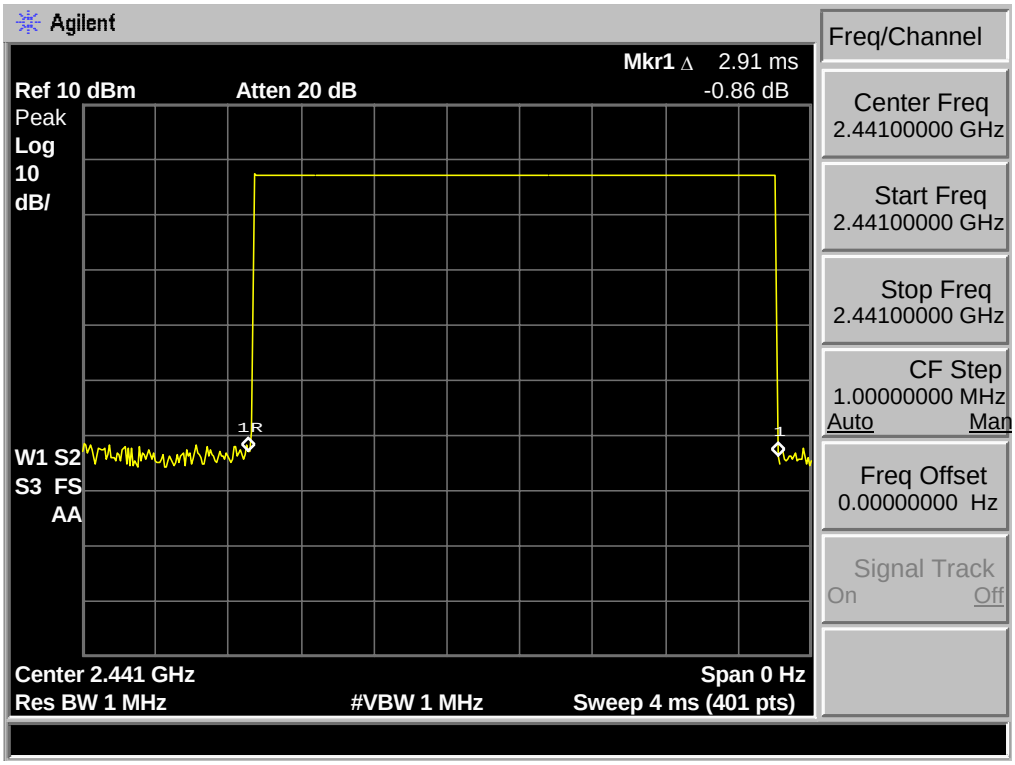
GFSK DH3 : 26hop/5s * 0.4 * 79 * 1.66ms= 272.8



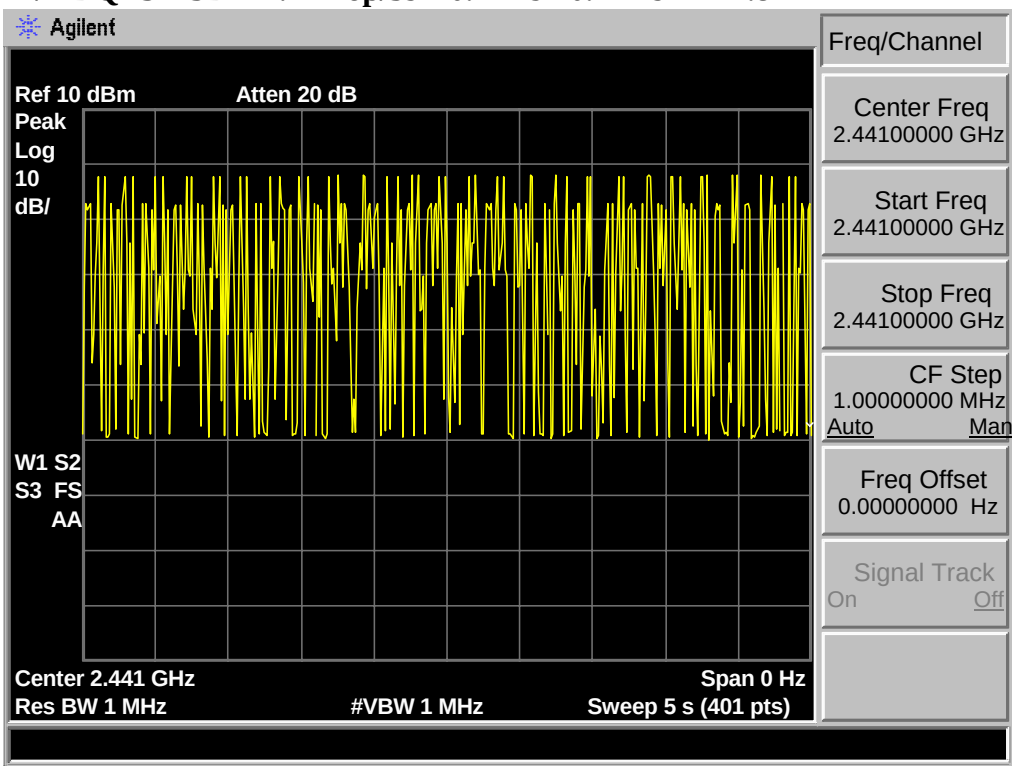


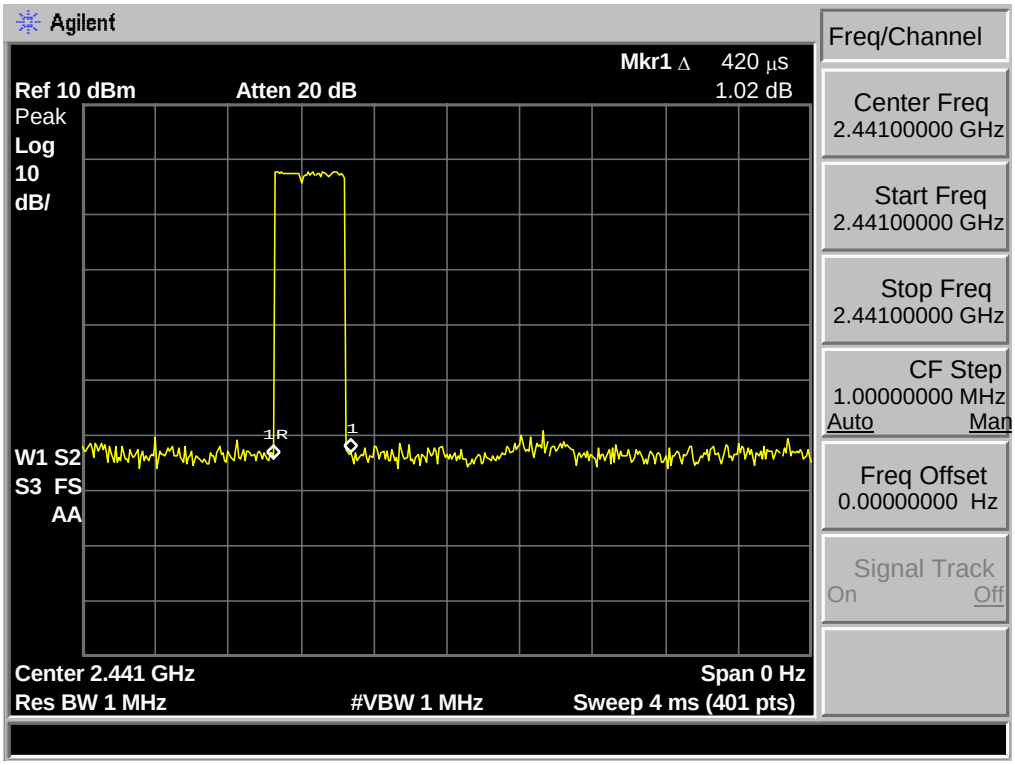
GSFK DH5 : 20hop/5s * 0.4 * 79 *2.91ms = 367.8



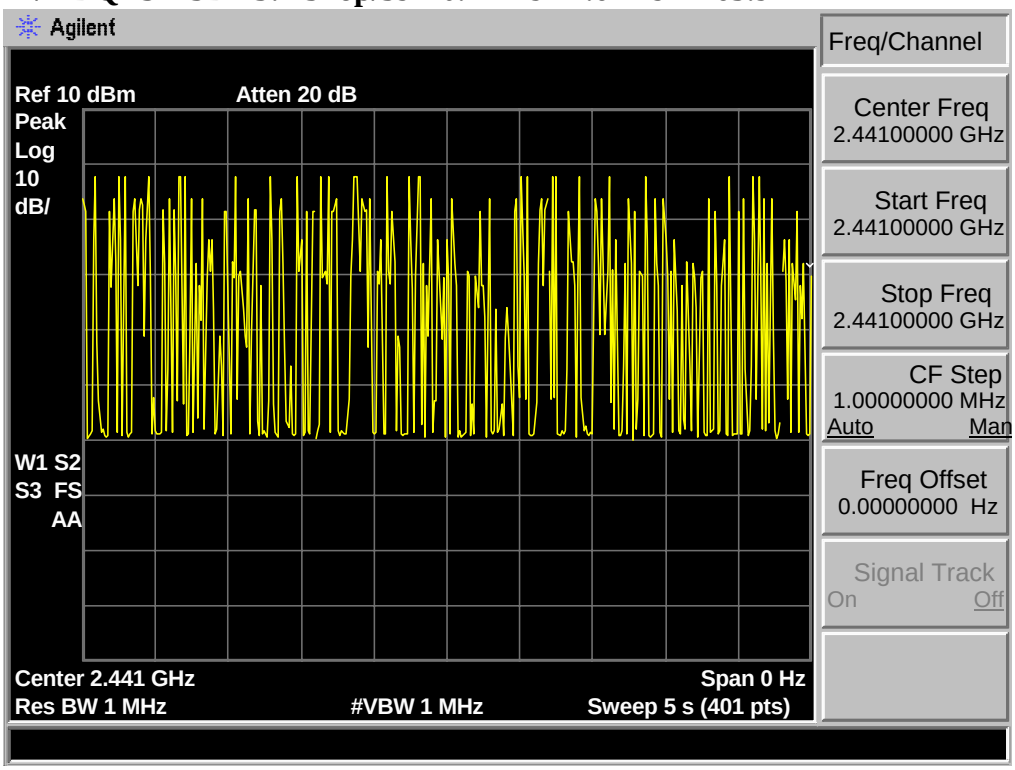


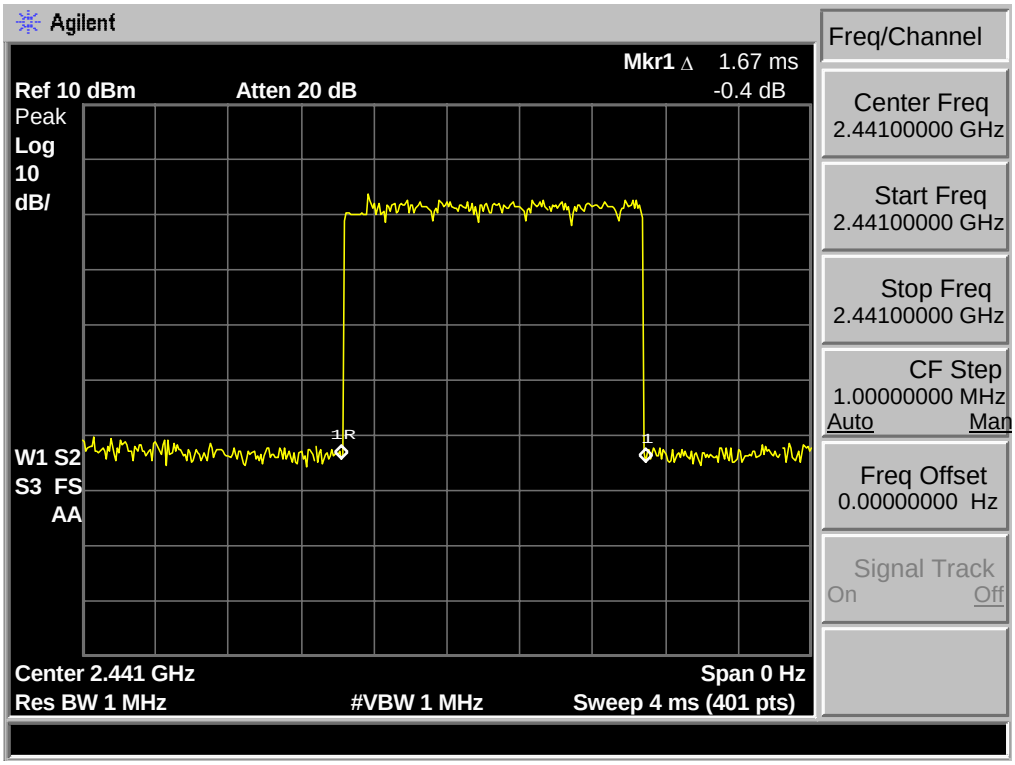
π /4-DQPSK 3DH1 : 47hop/5s * 0.4* 79 *0.42ms = 124.8



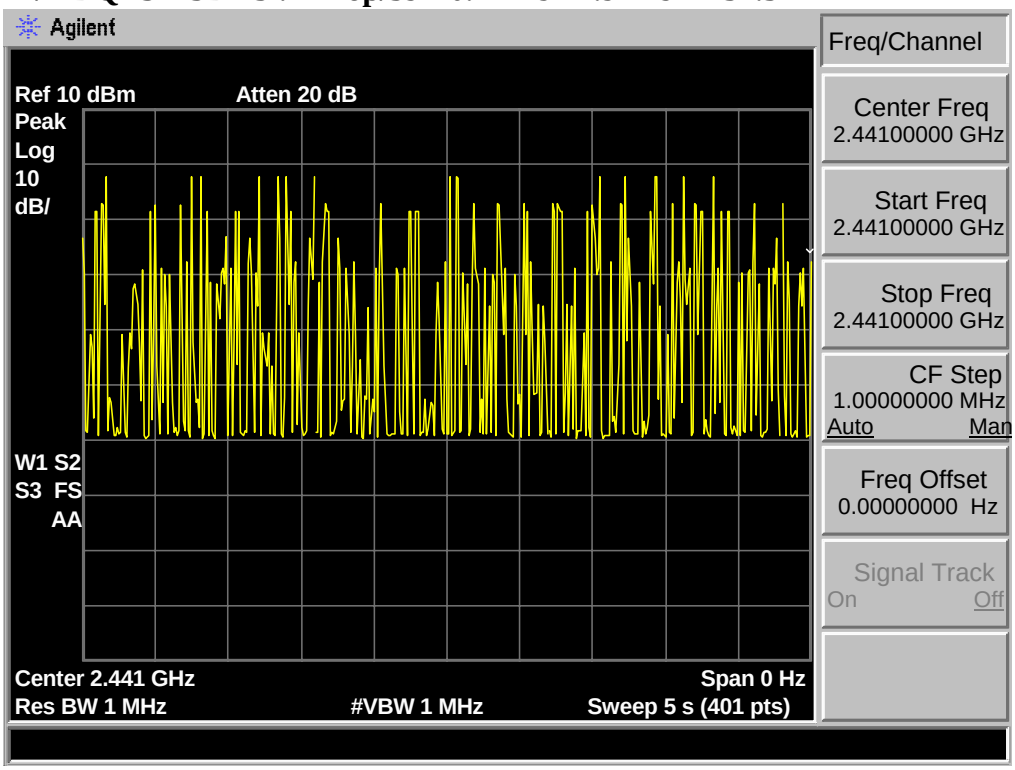


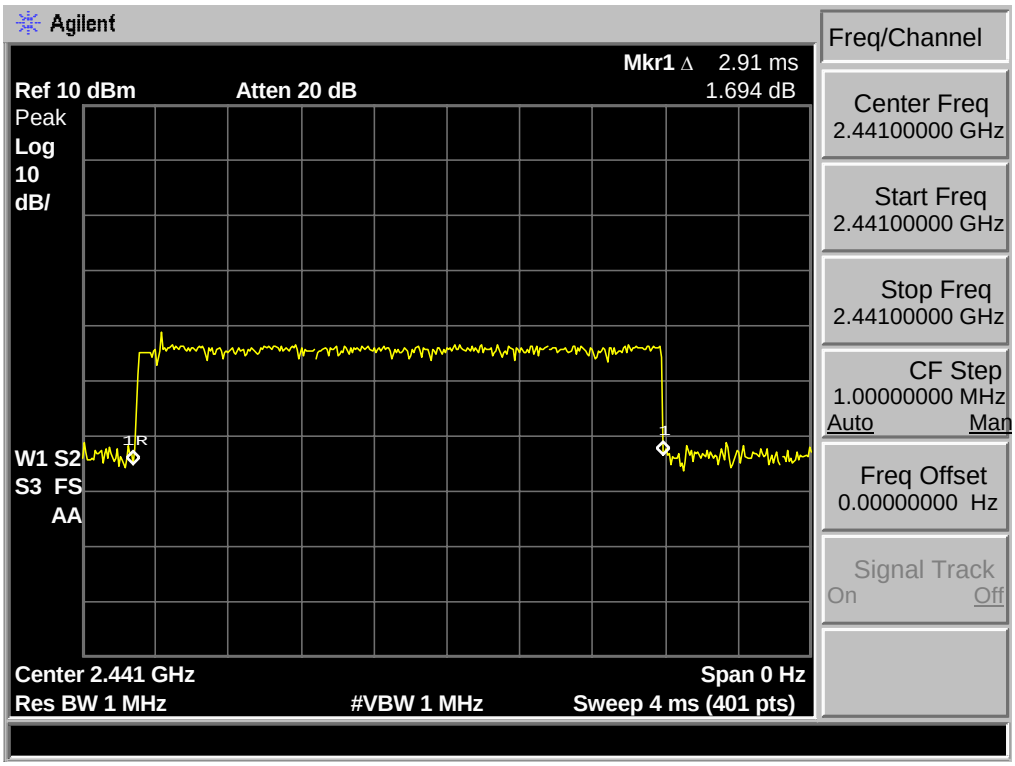
π /4-DQPSK 3DH3: 25hop/5s * 0.4 * 79 *1.67ms = 263.9





π /4-DQPSK 3DH5 : 14hop/5s * 0.4 * 79 *2.91ms = 257.5





8. RADIATED EMISSIONS

8.1. Limit

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

15.205 Restricted frequency band

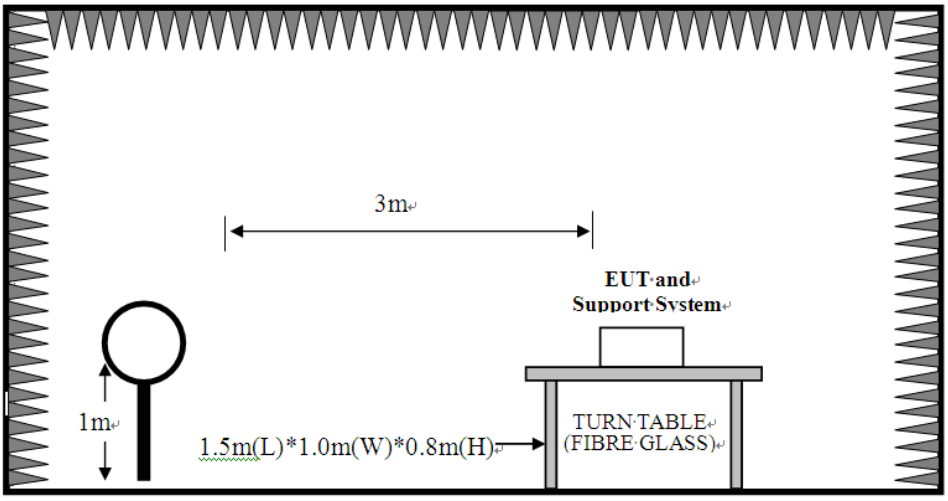
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

15.209 Limit

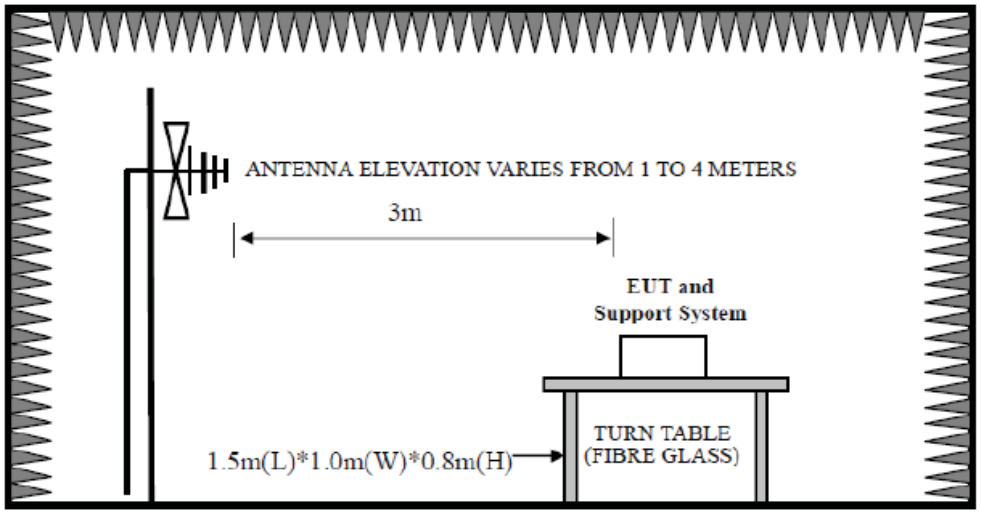
Frequency (MHz)	Field strength (μV/m)	Distance (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

8.2. Block Diagram of Test setup

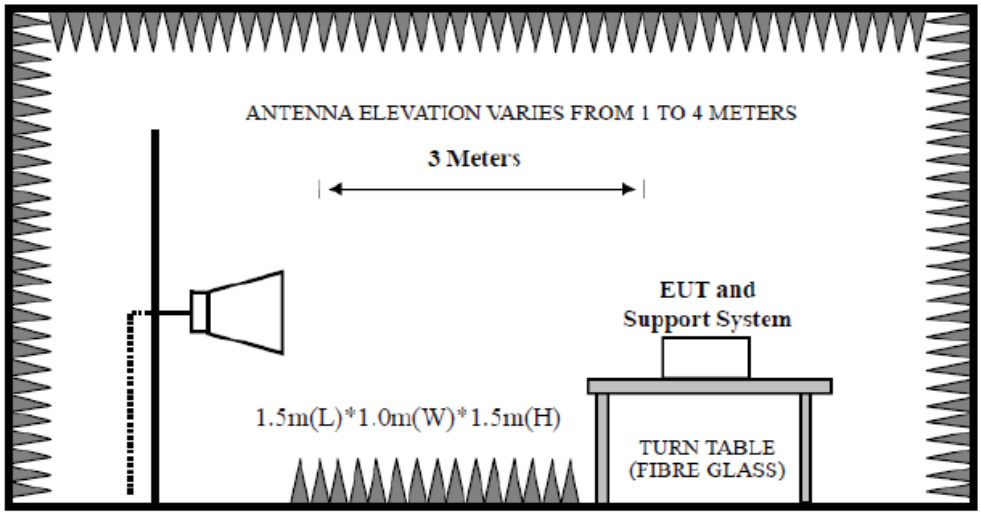
9kHz~30MHz



30~1000MHz



Above 1GHz



8.3. Test Procedure

EUT was placed on a turn table, which is 0.8 meter high above ground for 9kHz~1000MHz test, and which is 1.5 meter high above ground for above 1GHz test. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

The test frequency analyzer system was set to Peak Detect (300Hz RBW in 9kHz to 150kHz and 10kHz RBW in 150kHz to 30MHz) Function and Specified Bandwidth with Maximum Hold Mode.

The bandwidth of the EMI test receiver (R&S ESVS10) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 1MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz

PEAK detector, 1MHz/1MHz for PAEK measurement,

PEAK detector, 1MHz/10Hz for Average measurement

The frequency range from 30MHz to 10th harmonic (25GHz) are checked.

The EUT position(X.-axis, Y-axis, Z-axis) were checked and worse case was happened in Y-axis position.So Y-axis position was chose for find measurement.

8.4. Test Result

30MHz—25GHz Radiated emissison Test result
EUT: Portable Speaker M/N: LI-S20128BT
Power: DC3.7V
Test date: 2016-06-03~2016-06-12 Test site: 3m Chamber Tested by: Tony Tang
Test mode: Tx Mode
Pass

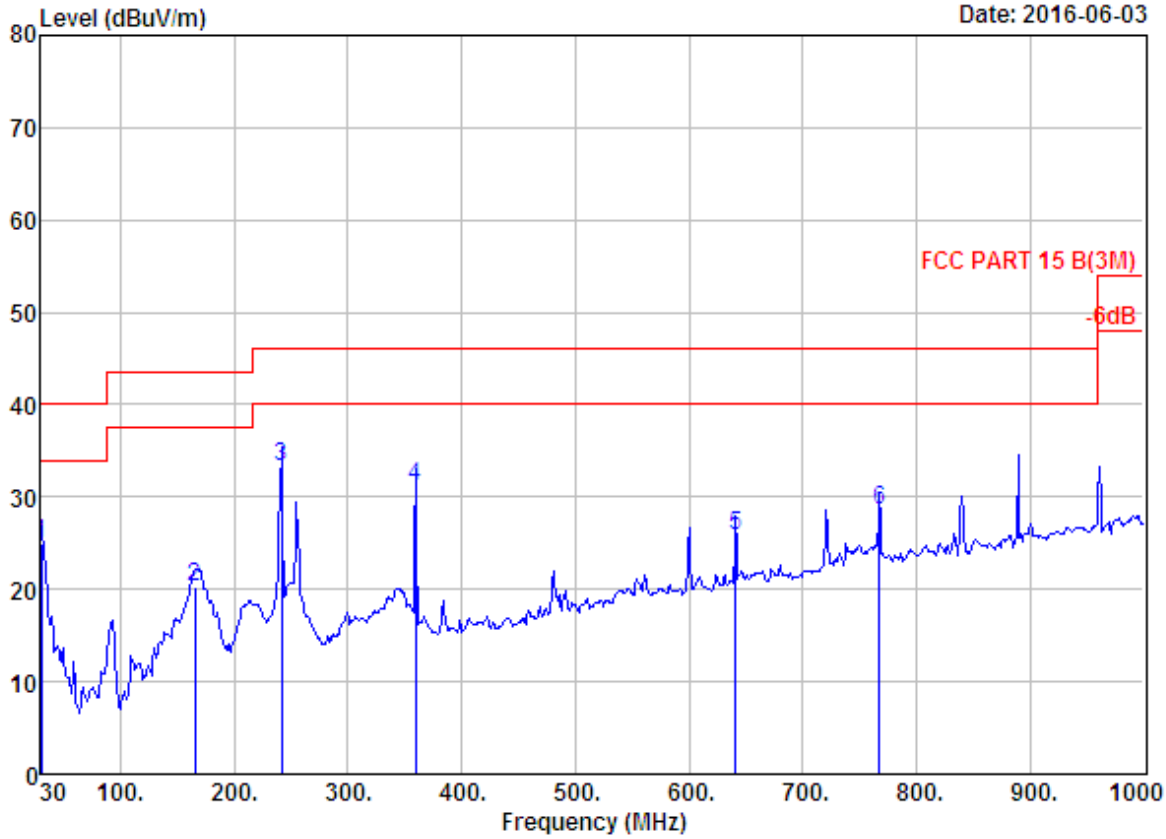
Note: 1、For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

2、 The frequency 2402MHz 、2441MHz and 2480MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

8.5. Test Data

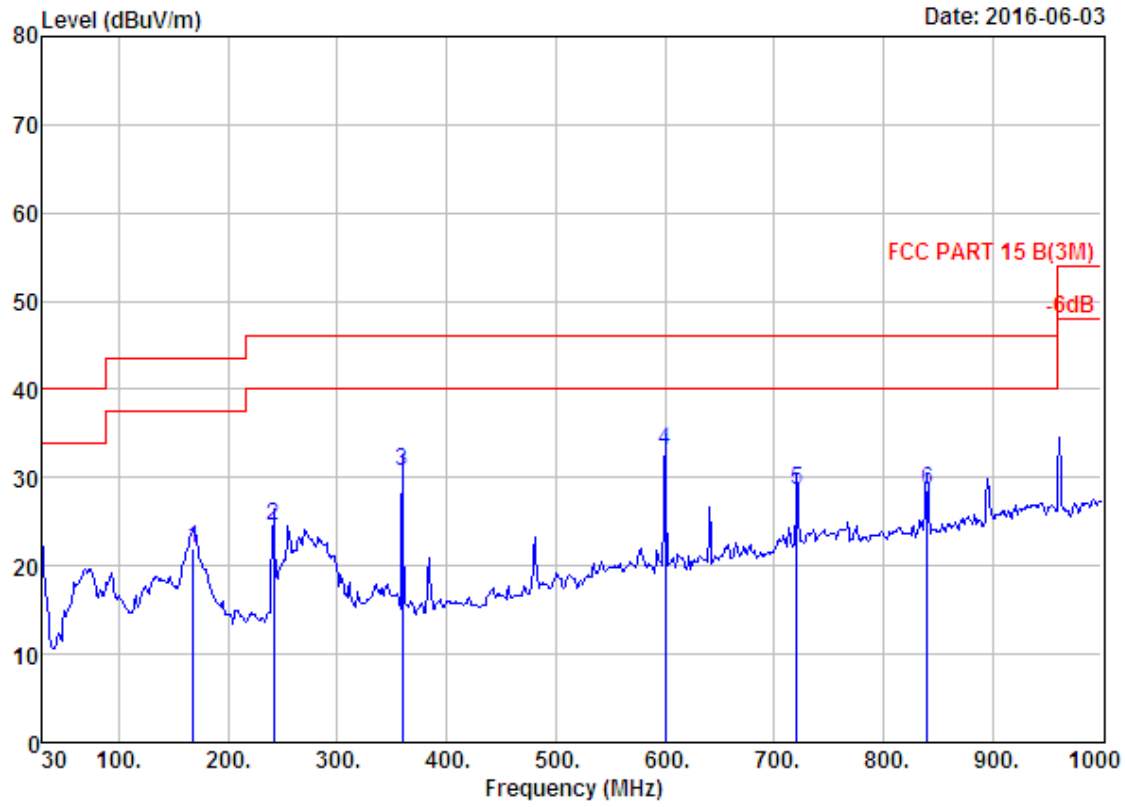
9 kHz – 30 MHz
Pass
Note: The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

30 MHz – 1000 MHz



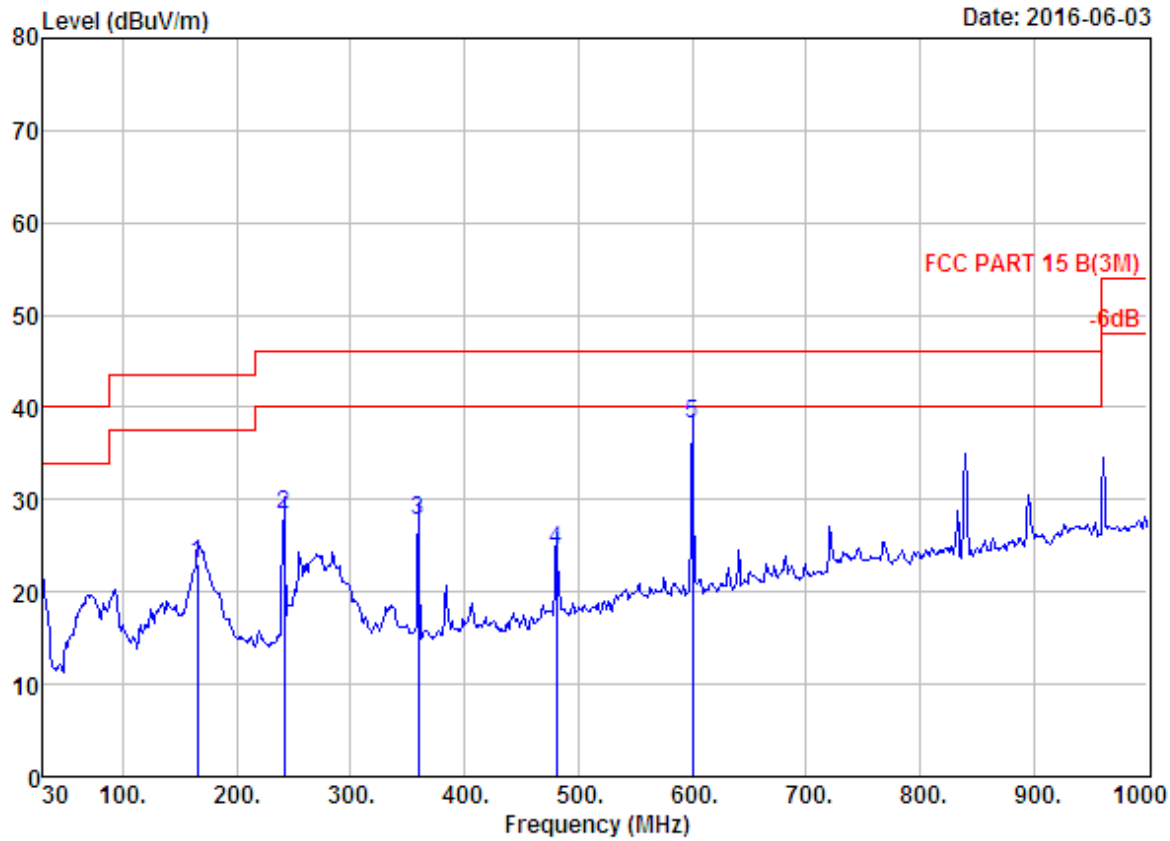
Site no. : 966 1# chamber Data no. : 41
Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	30.00	18.51	0.65	37.27	24.97	40.00	15.03	QP
2	165.80	9.66	1.68	40.02	20.28	43.50	23.22	QP
3	241.46	10.50	2.14	51.70	33.34	46.00	12.66	QP
4	359.80	14.45	2.59	45.08	31.14	46.00	14.86	QP
5	641.10	20.02	3.56	33.14	25.90	46.00	20.10	QP
6	767.20	22.04	3.87	33.30	28.52	46.00	17.48	QP



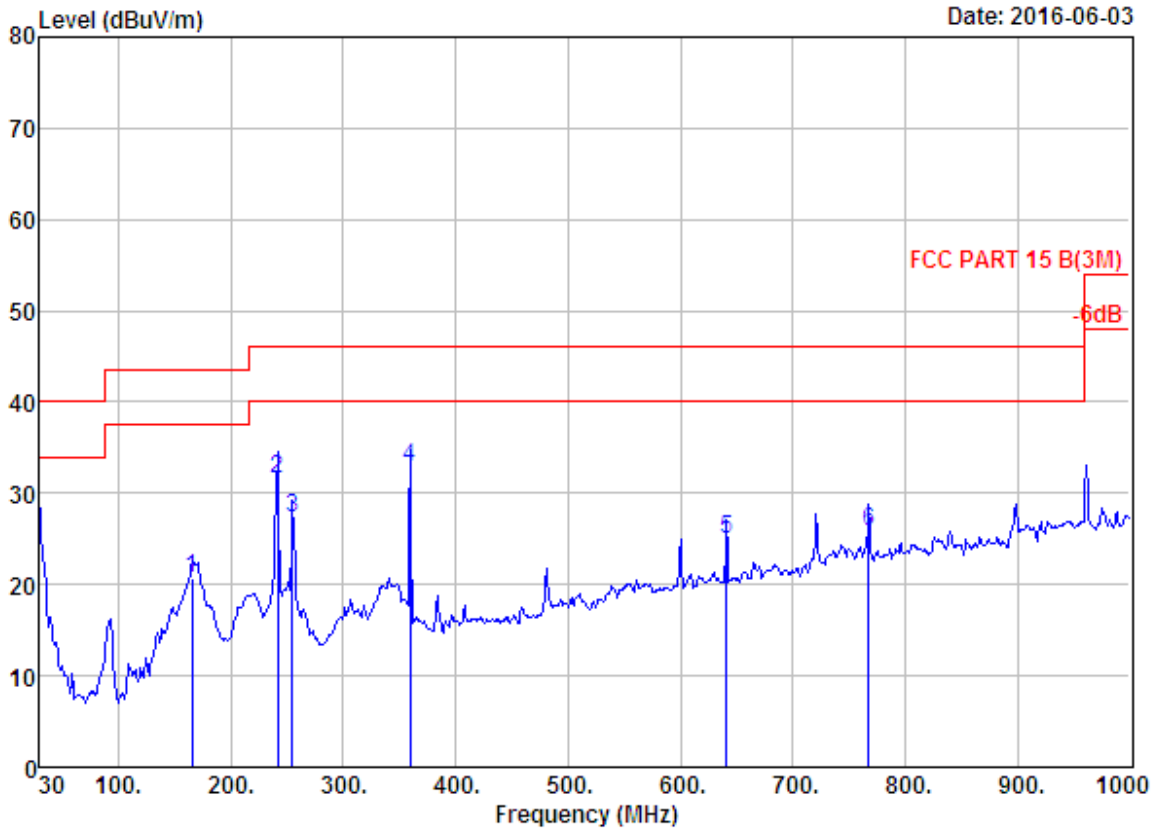
Site no. : 966 1# chamber Data no. : 42
Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	167.74	9.43	1.71	42.01	22.05	43.50	21.45	QP
2	241.46	10.50	2.14	42.91	24.55	46.00	21.45	QP
3	359.80	14.45	2.59	44.65	30.71	46.00	15.29	QP
4	600.36	19.60	3.44	41.21	33.08	46.00	12.92	QP
5	720.64	21.55	3.72	34.30	28.55	46.00	17.45	QP
6	839.95	22.60	3.76	32.68	28.55	46.00	17.45	QP



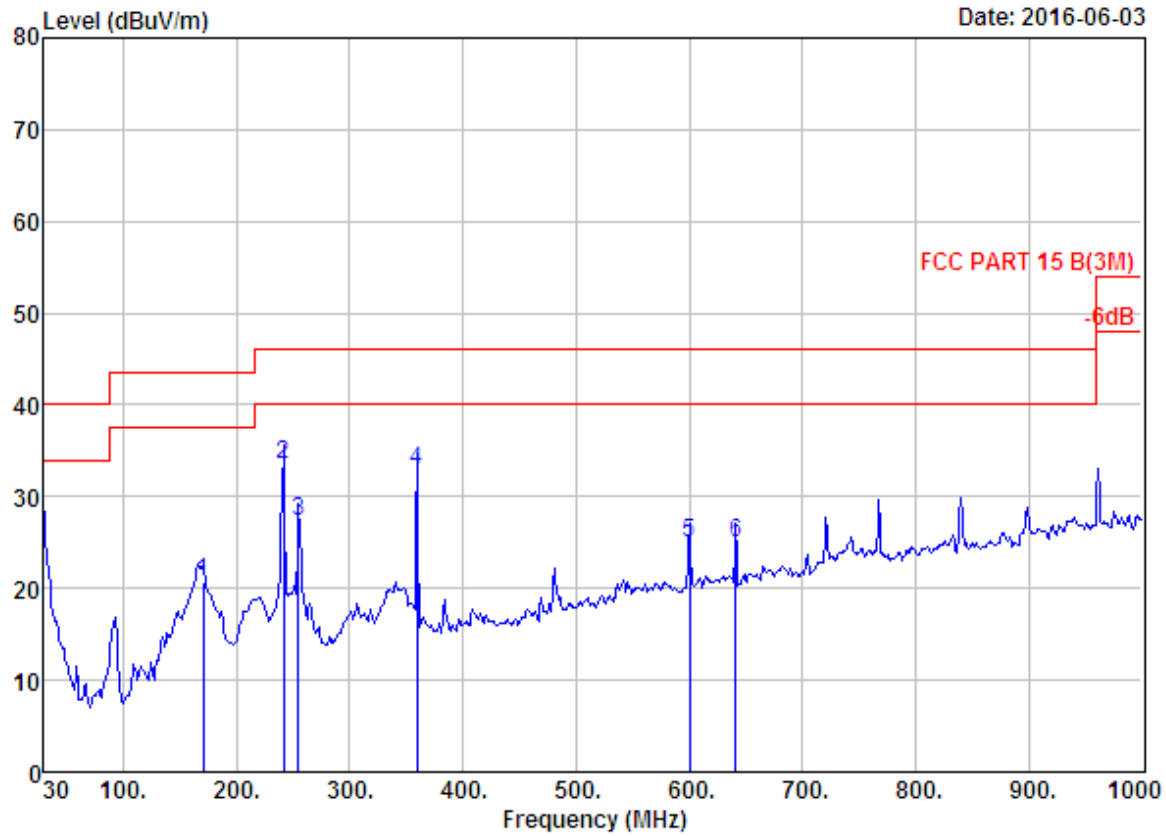
Site no. : 966 1# chamber Data no. : 43
Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	165.80	9.66	1.68	42.84	23.10	43.50	20.40	QP
2	241.46	10.50	2.14	46.71	28.35	46.00	17.65	QP
3	359.80	14.45	2.59	41.64	27.70	46.00	18.30	QP
4	481.05	17.49	3.09	34.89	24.55	46.00	21.45	QP
5	600.36	19.60	3.44	46.42	38.29	46.00	7.71	QP



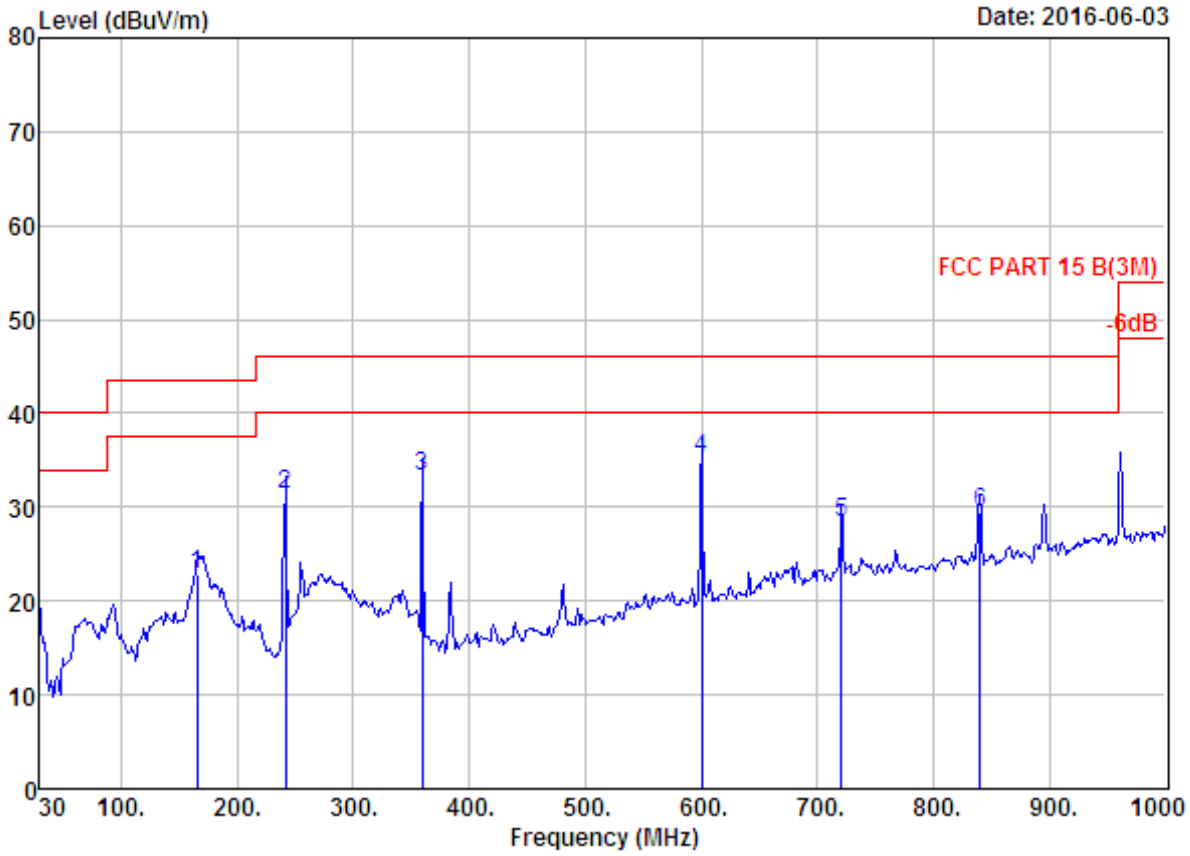
Site no. : 966 1# chamber Data no. : 44
Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	165.80	9.66	1.68	40.36	20.62	43.50	22.88	QP
2	241.46	10.50	2.14	49.92	31.56	46.00	14.44	QP
3	255.04	12.41	2.13	43.72	27.22	46.00	18.78	QP
4	359.80	14.45	2.59	46.71	32.77	46.00	13.23	QP
5	641.10	20.02	3.56	32.28	25.04	46.00	20.96	QP
6	767.20	22.04	3.87	30.57	25.79	46.00	20.21	QP



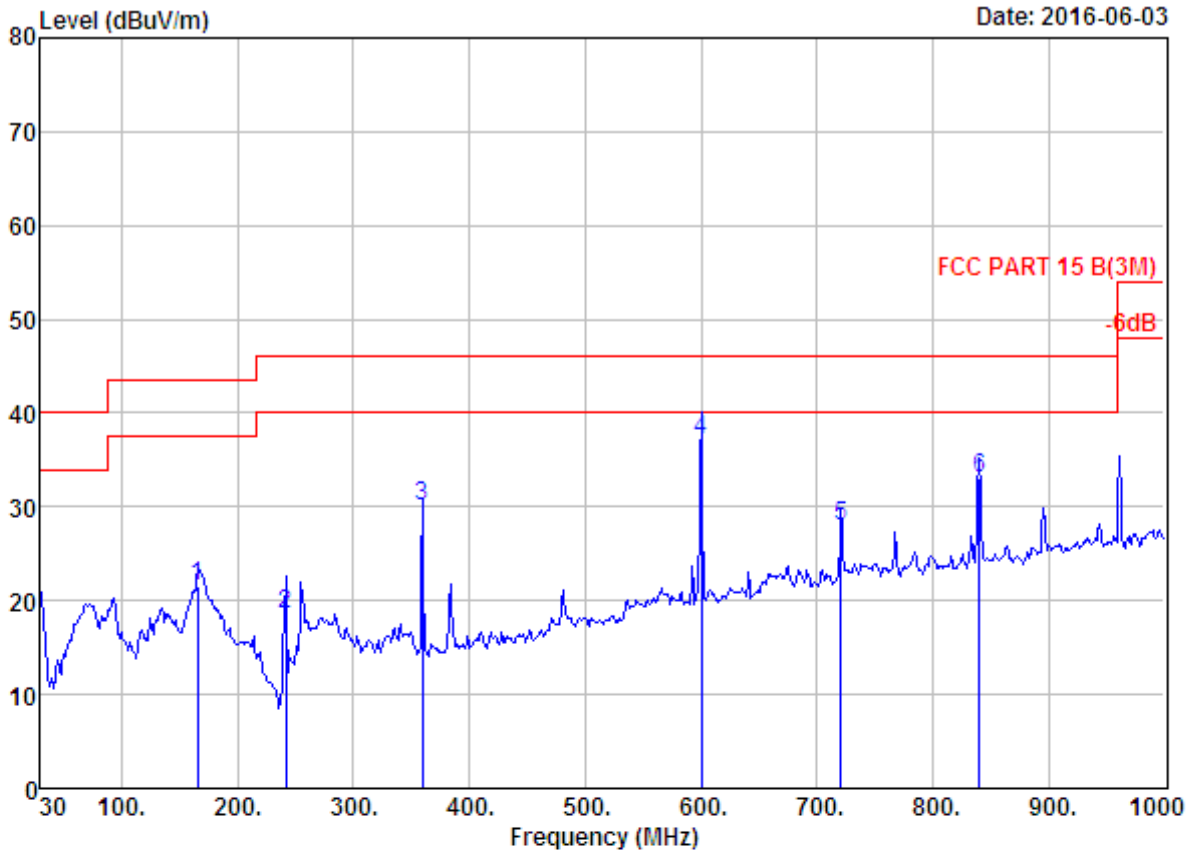
Site no. : 966 1# chamber Data no. : 45
Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	170.65	9.16	1.69	40.93	20.64	43.50	22.86	QP
2	241.46	10.50	2.14	51.94	33.58	46.00	12.42	QP
3	255.04	12.41	2.13	43.72	27.22	46.00	18.78	QP
4	359.80	14.45	2.59	46.71	32.77	46.00	13.23	QP
5	600.36	19.60	3.44	33.16	25.03	46.00	20.97	QP
6	641.10	20.02	3.56	32.28	25.04	46.00	20.96	QP



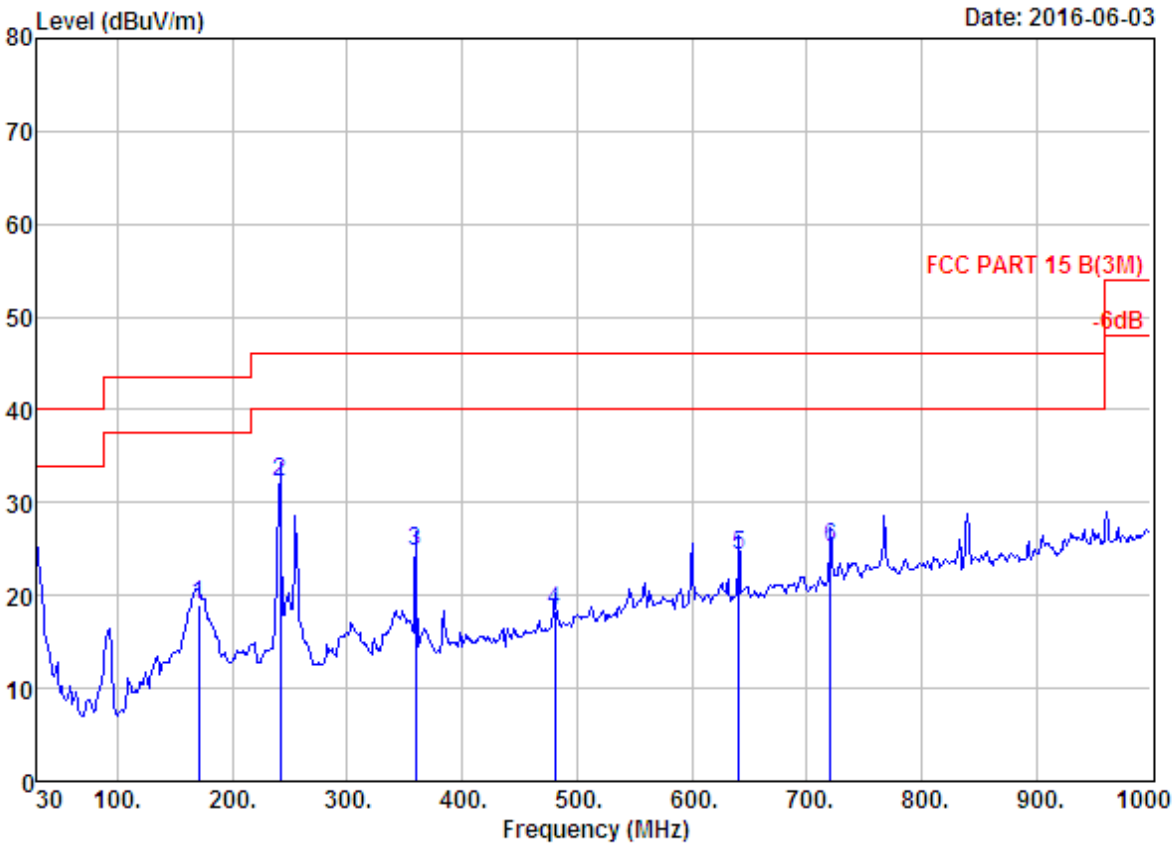
Site no. : 966 1# chamber Data no. : 46
Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	165.80	9.66	1.68	42.64	22.90	43.50	20.60	QP
2	241.46	10.50	2.14	49.70	31.34	46.00	14.66	QP
3	359.80	14.45	2.59	47.16	33.22	46.00	12.78	QP
4	600.36	19.60	3.44	43.38	35.25	46.00	10.75	QP
5	720.64	21.55	3.72	34.14	28.39	46.00	17.61	QP
6	839.95	22.60	3.76	33.59	29.46	46.00	16.54	QP



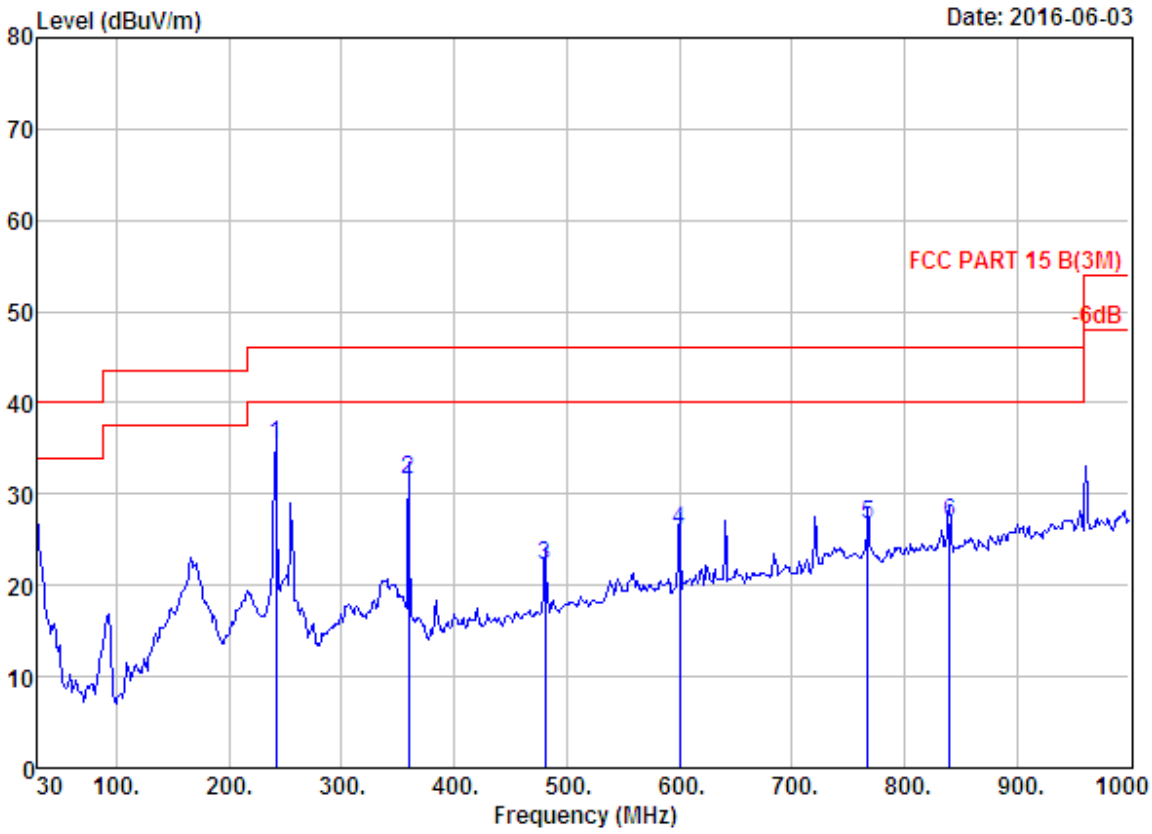

```
Site no.        : 966 1# chamber              Data no.   : 47
Dis. / Ant.     : 3m   27137                  Ant. pol.  : HORIZONTAL
Limit           : FCC PART 15 B(3M)
Env. / Ins.     : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer        : Tony
EUT             : Portable Speaker
Power           : DC 3.7V
M/N             : LI-S20128BT
Test Mode       : (π/4)DQPSK TX 2402MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	165.80	9.66	1.68	41.28	21.54	43.50	21.96	QP
2	241.46	10.50	2.14	37.01	18.65	46.00	27.35	QP
3	359.80	14.45	2.59	43.92	29.98	46.00	16.02	QP
4	600.36	19.60	3.44	45.28	37.15	46.00	8.85	QP
5	720.64	21.55	3.72	33.67	27.92	46.00	18.08	QP
6	839.95	22.60	3.76	37.30	33.17	46.00	12.83	QP



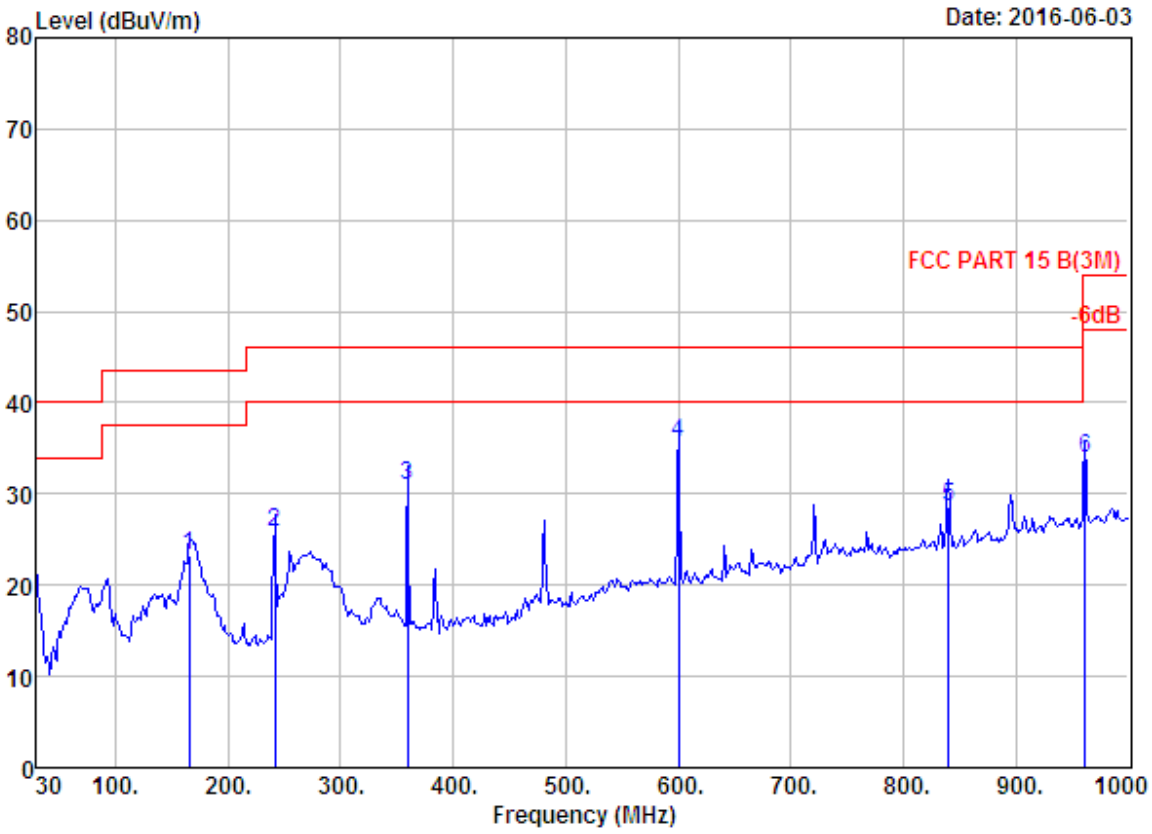

```
Site no.        : 966 1# chamber              Data no.   : 48
Dis. / Ant.     : 3m   27137                  Ant. pol.  : VERTICAL
Limit           : FCC PART 15 B(3M)
Env. / Ins.     : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer        : Tony
EUT             : Portable Speaker
Power           : DC 3.7V
M/N             : LI-S20128BT
Test Mode       : (π/4)DQPSK TX 2402MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	170.65	9.16	1.69	39.19	18.90	43.50	24.60	QP
2	241.46	10.50	2.14	50.65	32.29	46.00	13.71	QP
3	359.80	14.45	2.59	38.75	24.81	46.00	21.19	QP
4	481.05	17.49	3.09	28.61	18.27	46.00	27.73	QP
5	641.10	20.02	3.56	31.60	24.36	46.00	21.64	QP
6	720.64	21.55	3.72	30.98	25.23	46.00	20.77	QP



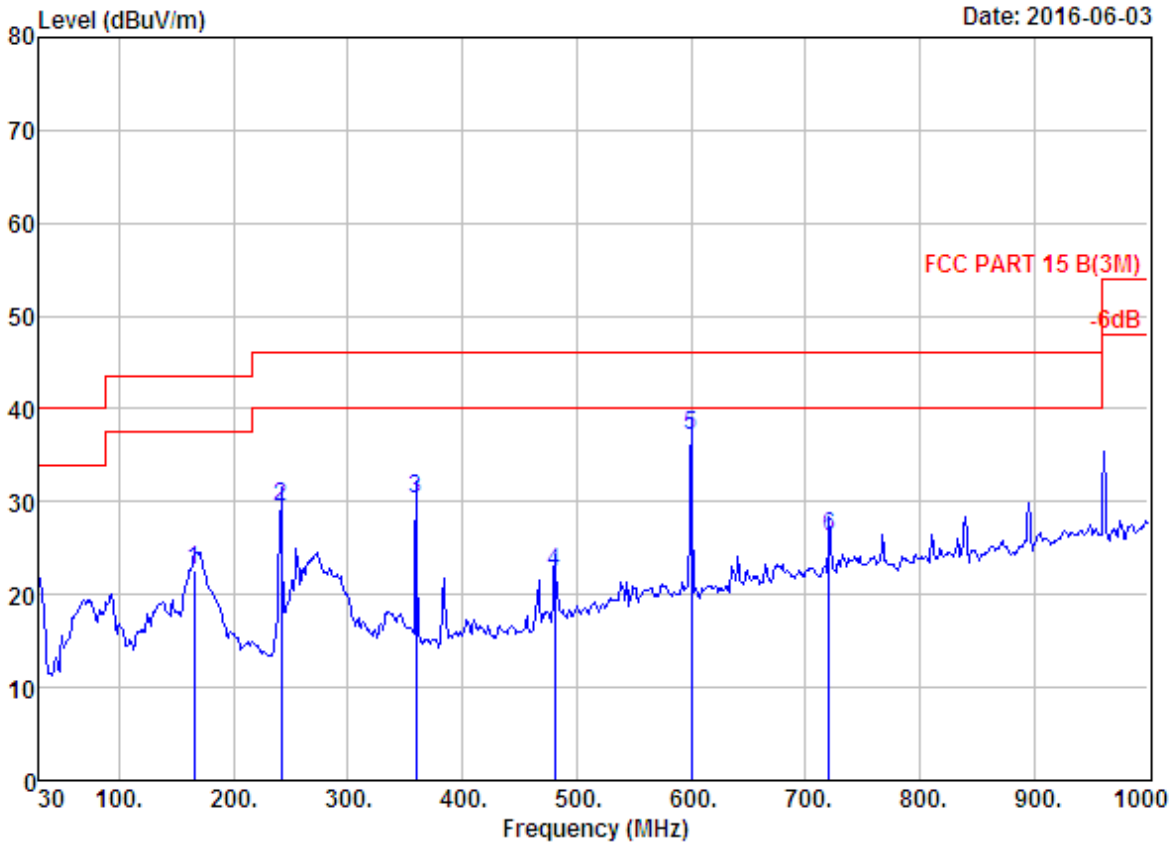

```
Site no.        : 966 1# chamber              Data no.   : 49
Dis. / Ant.     : 3m   27137                  Ant. pol.  : VERTICAL
Limit           : FCC PART 15 B(3M)
Env. / Ins.     : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer        : Tony
EUT             : Portable Speaker
Power           : DC 3.7V
M/N             : LI-S20128BT
Test Mode       : (π/4)DQPSK TX 2441MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	241.46	10.50	2.14	53.71	35.35	46.00	10.65	QP
2	359.80	14.45	2.59	45.53	31.59	46.00	14.41	QP
3	481.05	17.49	3.09	32.53	22.19	46.00	23.81	QP
4	600.36	19.60	3.44	34.14	26.01	46.00	19.99	QP
5	767.20	22.04	3.87	31.38	26.60	46.00	19.40	QP
6	839.95	22.60	3.76	31.01	26.88	46.00	19.12	QP



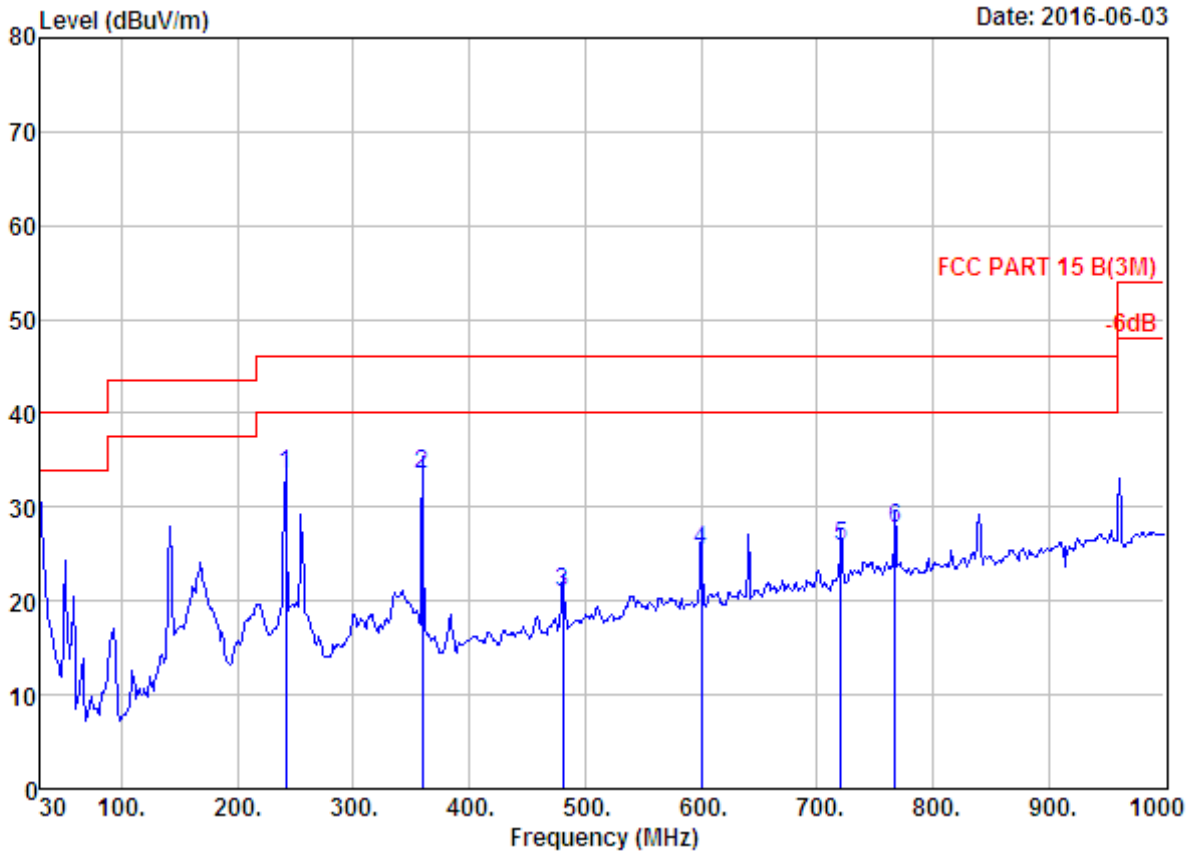
Site no. : 966 1# chamber Data no. : 50
Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	165.80	9.66	1.68	42.91	23.17	43.50	20.33	QP
2	241.46	10.50	2.14	44.13	25.77	46.00	20.23	QP
3	359.80	14.45	2.59	44.93	30.99	46.00	15.01	QP
4	600.36	19.60	3.44	43.83	35.70	46.00	10.30	QP
5	839.95	22.60	3.76	32.63	28.50	46.00	17.50	QP
6	961.20	24.49	4.65	34.58	33.83	54.00	20.17	QP



Site no. : 966 1# chamber Data no. : 51
Dis. / Ant. : 3m 27137 Ant. pol. : HORIZONTAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz

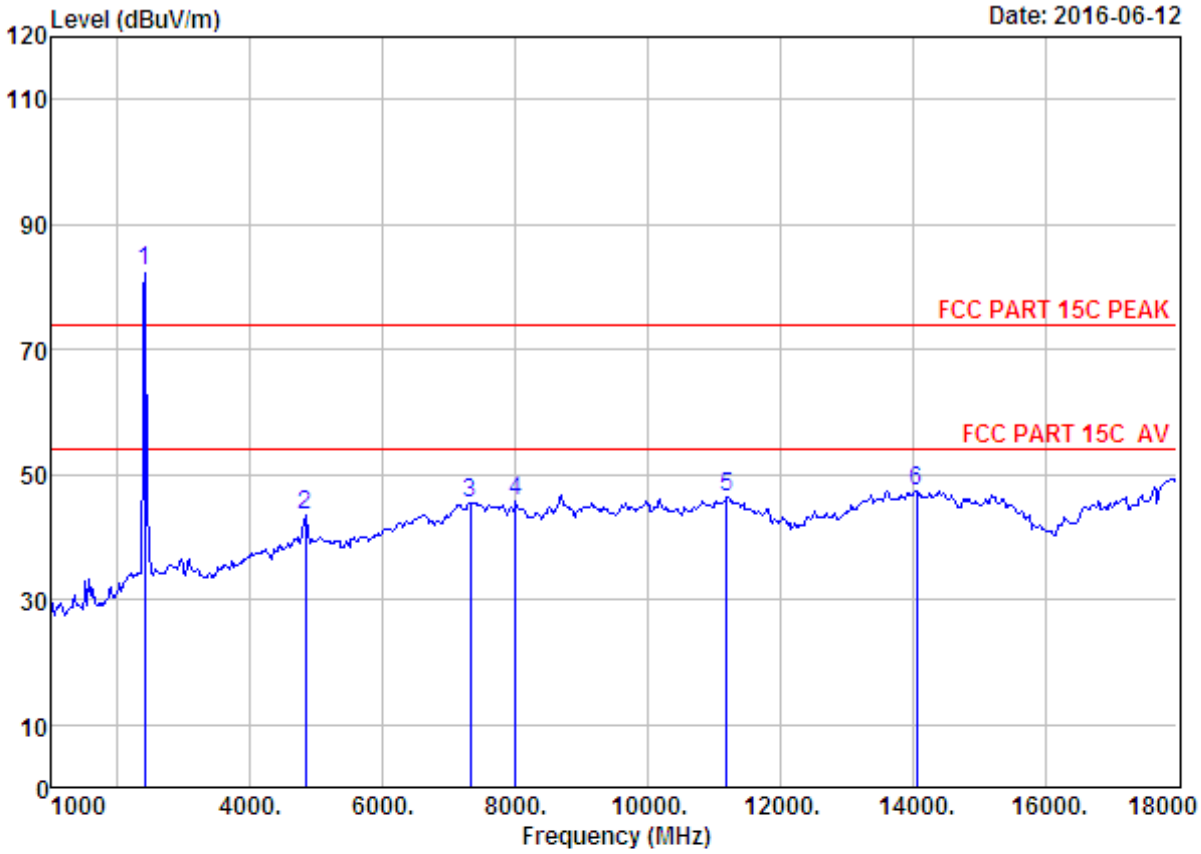
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	165.80	9.66	1.68	42.36	22.62	43.50	20.88	QP
2	241.46	10.50	2.14	47.90	29.54	46.00	16.46	QP
3	359.80	14.45	2.59	44.22	30.28	46.00	15.72	QP
4	481.05	17.49	3.09	32.65	22.31	46.00	23.69	QP
5	600.36	19.60	3.44	45.24	37.11	46.00	8.89	QP
6	720.64	21.55	3.72	32.07	26.32	46.00	19.68	QP



Site no. : 966 1# chamber Data no. : 52
Dis. / Ant. : 3m 27137 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	241.46	10.50	2.14	20.85	33.49	46.00	12.51	QP
2	359.80	14.45	2.59	16.46	33.50	46.00	12.50	QP
3	481.05	17.49	3.09	0.34	20.92	46.00	25.08	QP
4	600.36	19.60	3.44	2.39	25.43	46.00	20.57	QP
5	720.64	21.55	3.72	0.48	25.75	46.00	20.25	QP
6	767.20	22.04	3.87	1.79	27.70	46.00	18.30	QP

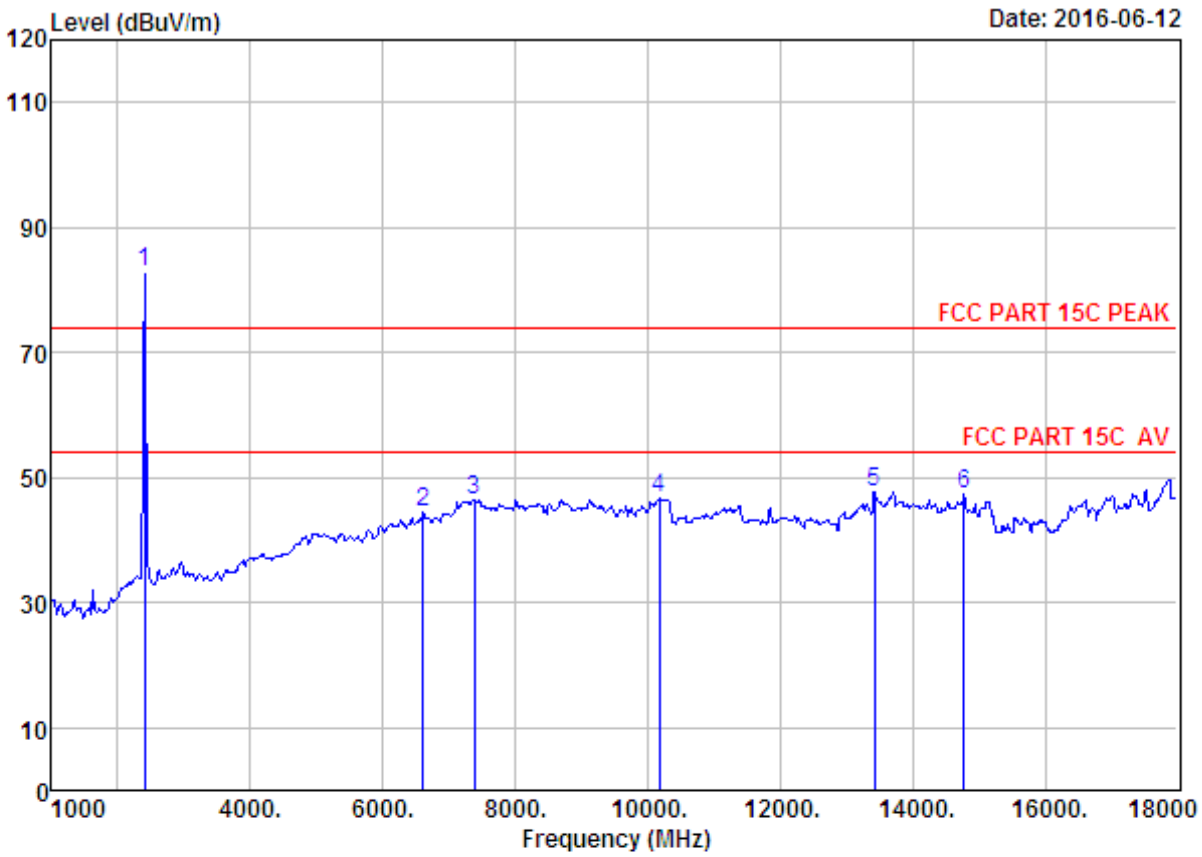
1000 MHz – 18000MHz



Site no. : 966 1# chamber Data no. : 1
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	6.62	34.64	82.94	82.53	74.00	-8.53	Peak
2	4825.00	31.28	11.84	35.66	36.08	43.54	74.00	30.46	Peak
3	7324.00	36.55	11.57	34.14	31.48	45.46	74.00	28.54	Peak
4	8004.00	37.01	11.40	34.96	32.17	45.62	74.00	28.38	Peak
5	11200.00	39.39	11.14	33.24	29.20	46.49	74.00	27.51	Peak
6	14056.00	41.51	10.90	33.06	28.17	47.52	74.00	26.48	Peak

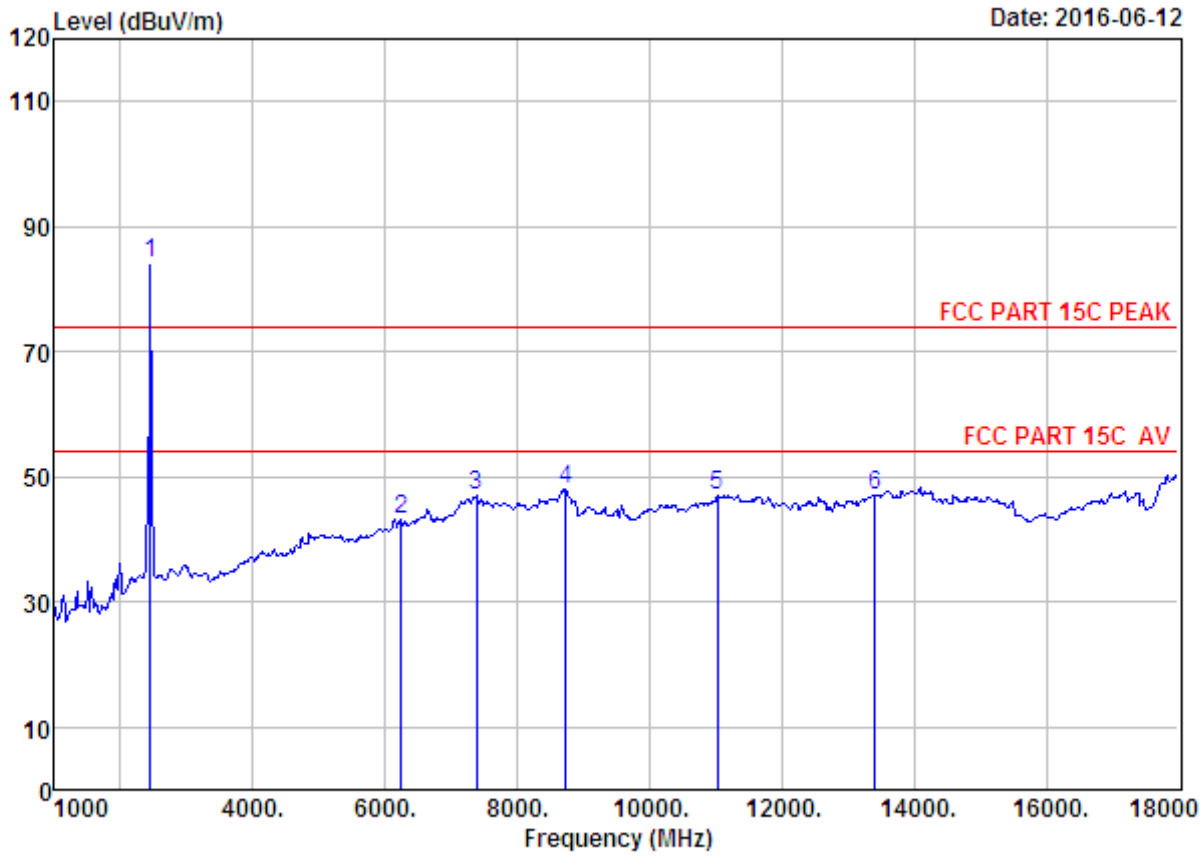
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 2
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	6.62	34.64	83.42	83.01	74.00	-9.01	Peak
2	6610.00	34.47	12.07	34.74	32.63	44.43	74.00	29.57	Peak
3	7375.00	36.57	11.59	34.21	32.59	46.54	74.00	27.46	Peak
4	10180.00	38.42	11.49	34.53	31.33	46.71	74.00	27.29	Peak
5	13427.00	39.91	11.49	32.80	29.13	47.73	74.00	26.27	Peak
6	14770.00	41.01	10.89	33.85	29.31	47.36	74.00	26.64	Peak

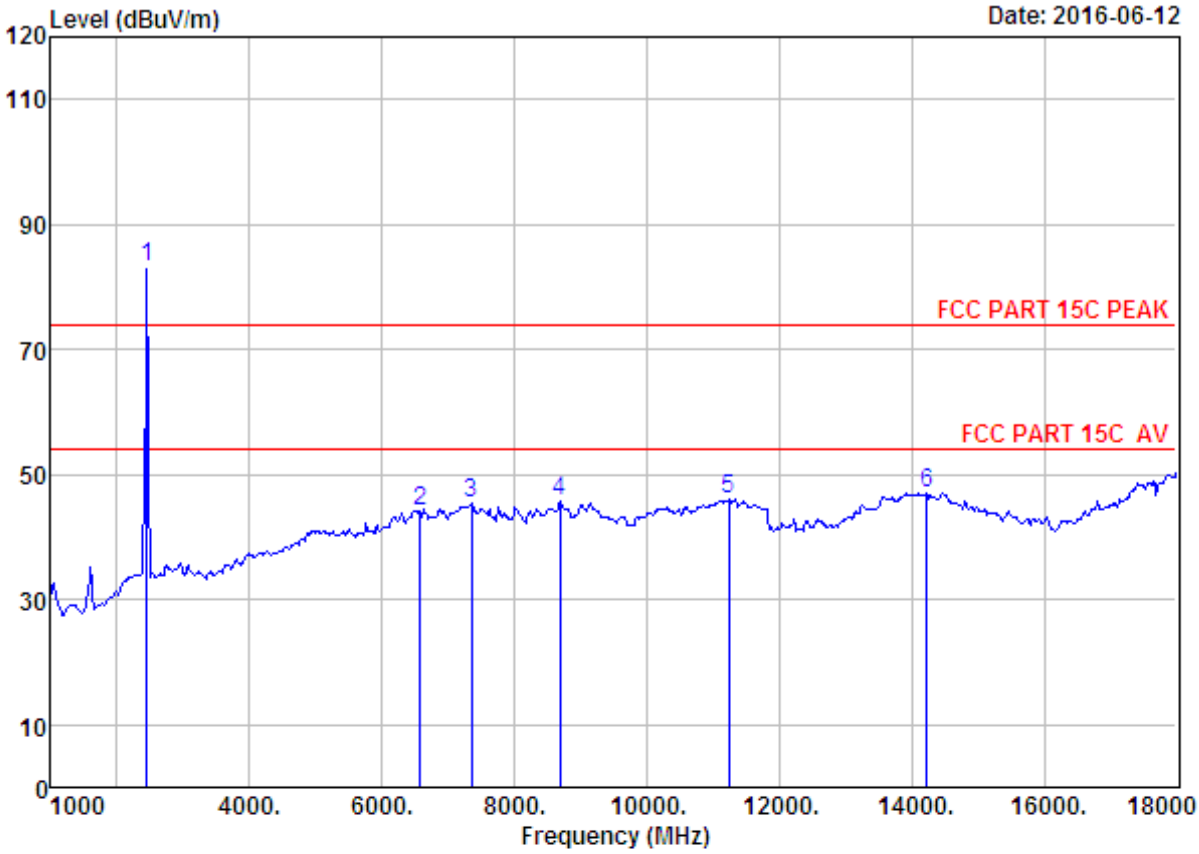
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 5
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.00	27.60	6.67	34.85	84.82	84.24	74.00	-10.24	Peak
2	6236.00	33.36	12.17	35.18	32.97	43.32	74.00	30.68	Peak
3	7375.00	36.57	11.59	34.21	33.10	47.05	74.00	26.95	Peak
4	8735.00	37.40	11.45	33.76	32.87	47.96	74.00	26.04	Peak
5	11030.00	39.50	11.27	33.98	30.30	47.09	74.00	26.91	Peak
6	13410.00	39.87	11.49	32.86	28.69	47.19	74.00	26.81	Peak

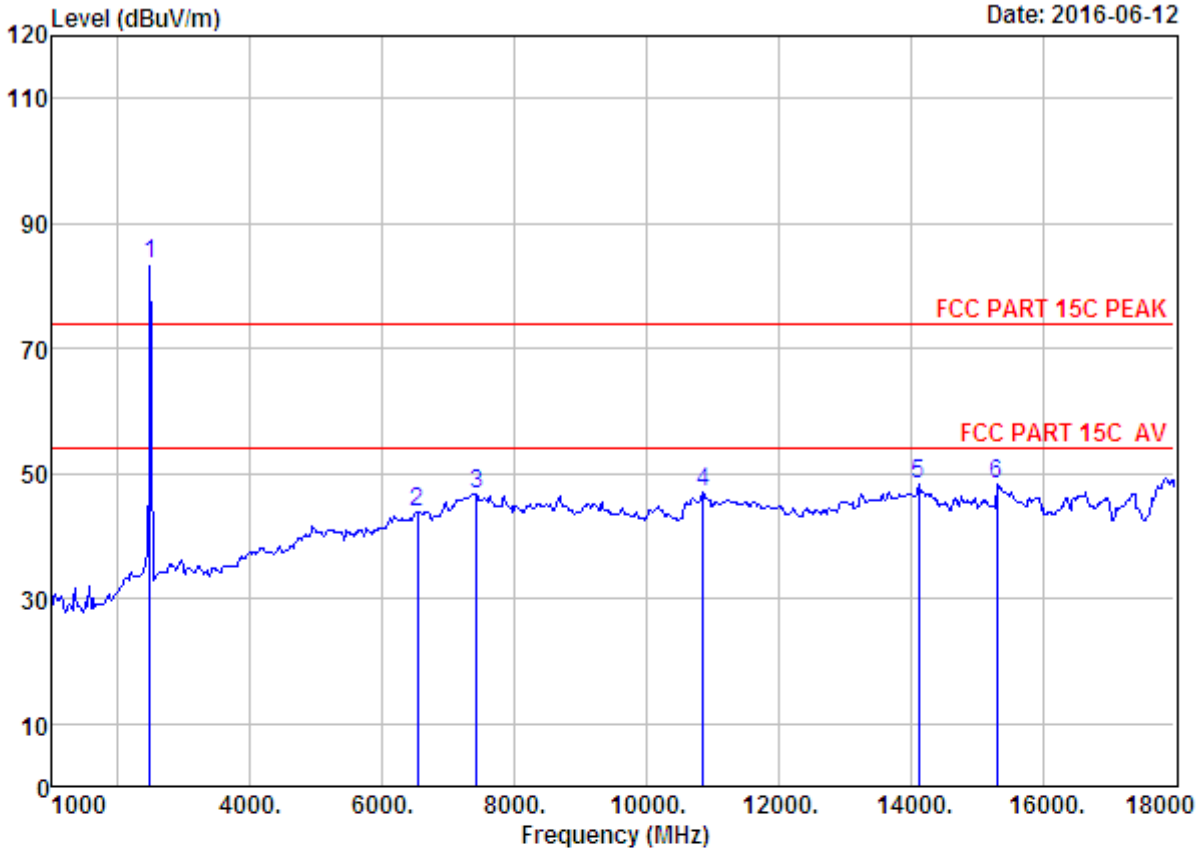
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 6
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2445.00	27.59	6.67	34.85	83.73	83.14	74.00	-9.14	Peak
2	6576.00	34.42	12.13	34.80	32.54	44.29	74.00	29.71	Peak
3	7358.00	36.56	11.58	34.19	31.34	45.29	74.00	28.71	Peak
4	8684.00	37.32	11.45	33.66	30.59	45.70	74.00	28.30	Peak
5	11234.00	39.37	11.12	33.25	28.81	46.05	74.00	27.95	Peak
6	14226.00	41.66	10.91	33.41	28.00	47.16	74.00	26.84	Peak

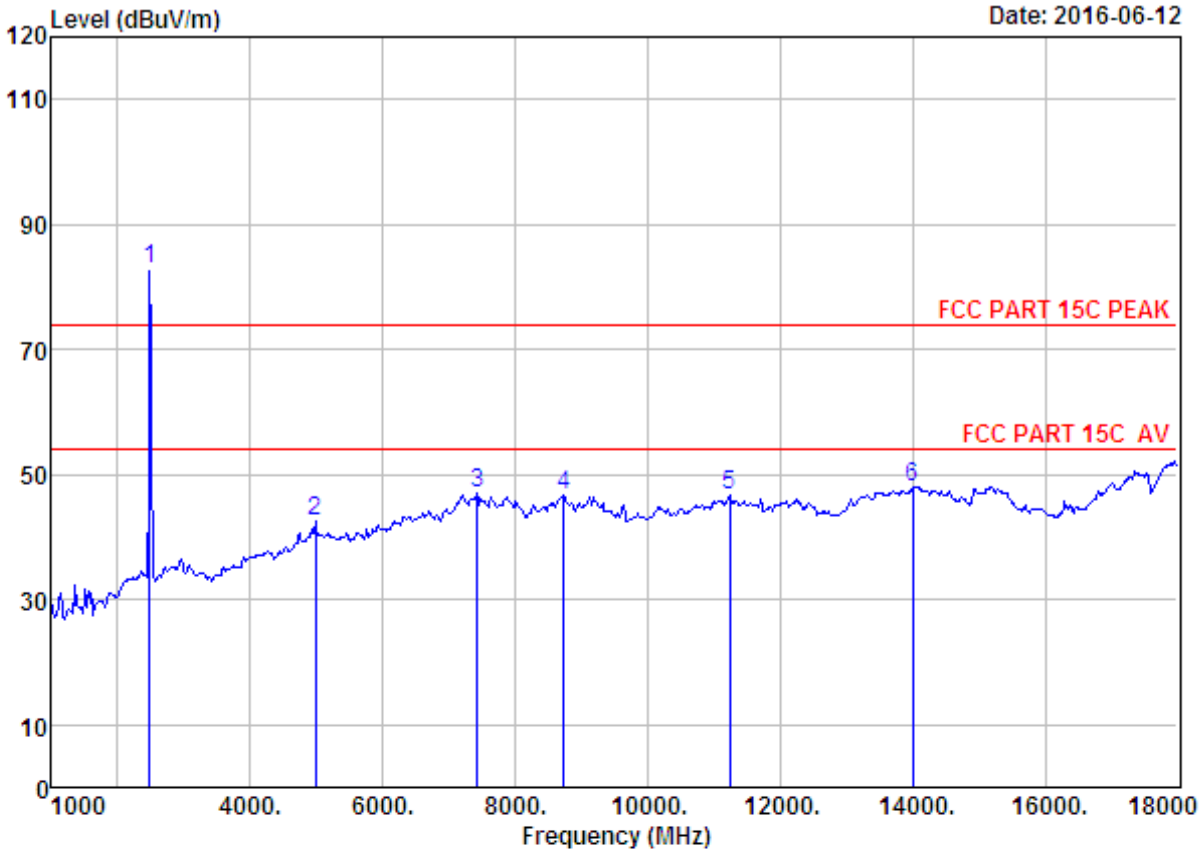
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 7
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.58	6.71	35.11	84.29	83.47	74.00	-9.47	Peak
2	6525.00	34.29	12.20	34.97	32.37	43.89	74.00	30.11	Peak
3	7426.00	36.56	11.60	34.22	32.80	46.74	74.00	27.26	Peak
4	10860.00	39.37	11.30	34.03	30.54	47.18	74.00	26.82	Peak
5	14124.00	41.57	10.91	33.22	28.98	48.24	74.00	25.76	Peak
6	15314.00	38.74	11.01	33.37	31.87	48.25	74.00	25.75	Peak

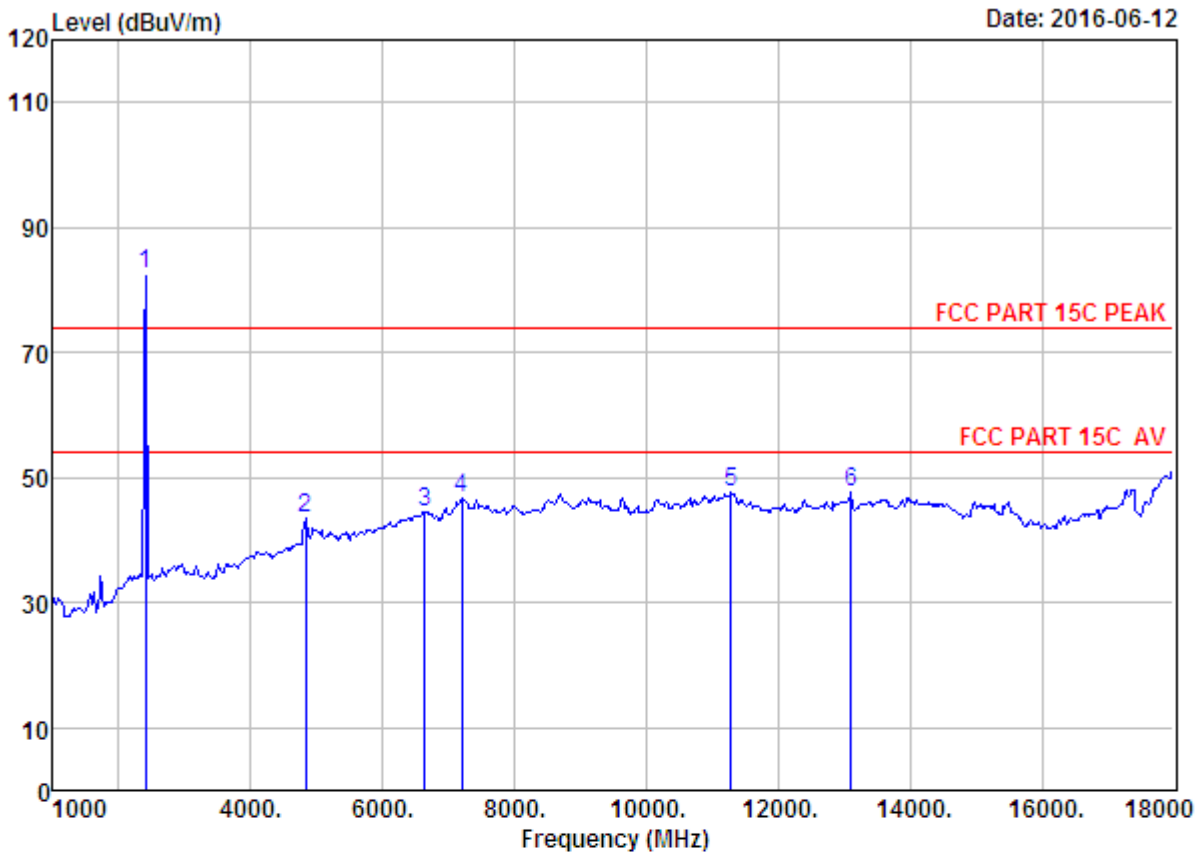
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 8
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.58	6.71	35.11	83.84	83.02	74.00	-9.02	Peak
2	4978.00	31.52	12.52	36.06	34.73	42.71	74.00	31.29	Peak
3	7426.00	36.56	11.60	34.22	32.96	46.90	74.00	27.10	Peak
4	8735.00	37.40	11.45	33.76	31.63	46.72	74.00	27.28	Peak
5	11234.00	39.37	11.12	33.25	29.40	46.64	74.00	27.36	Peak
6	14005.00	41.46	10.90	33.01	28.73	48.08	74.00	25.92	Peak

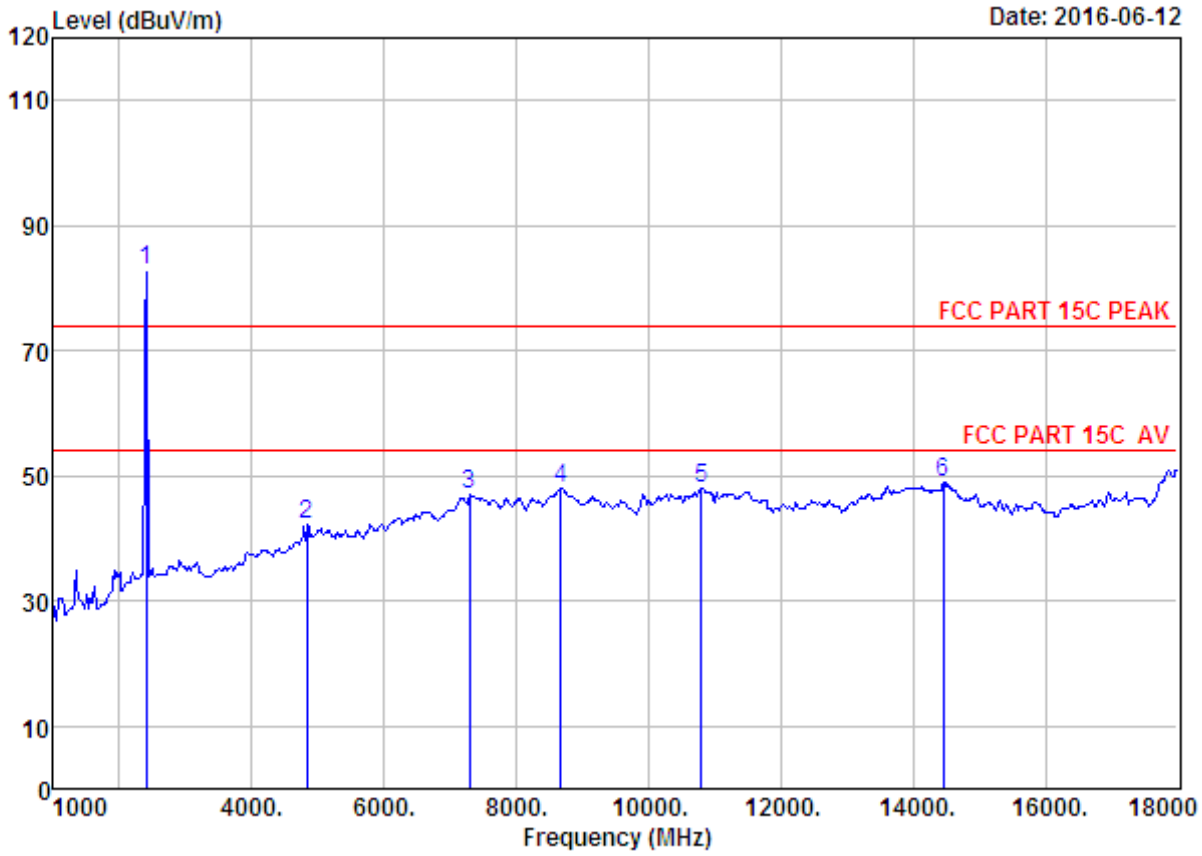
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 11
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2402MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	6.62	34.64	83.08	82.67	74.00	-8.67	Peak
2	4825.00	31.28	11.84	35.66	36.09	43.55	74.00	30.45	Peak
3	6644.00	34.48	12.02	34.66	32.77	44.61	74.00	29.39	Peak
4	7205.00	36.52	11.54	33.92	32.53	46.67	74.00	27.33	Peak
5	11285.00	39.33	11.08	33.32	30.46	47.55	74.00	26.45	Peak
6	13104.00	39.13	11.44	32.77	29.78	47.58	74.00	26.42	Peak

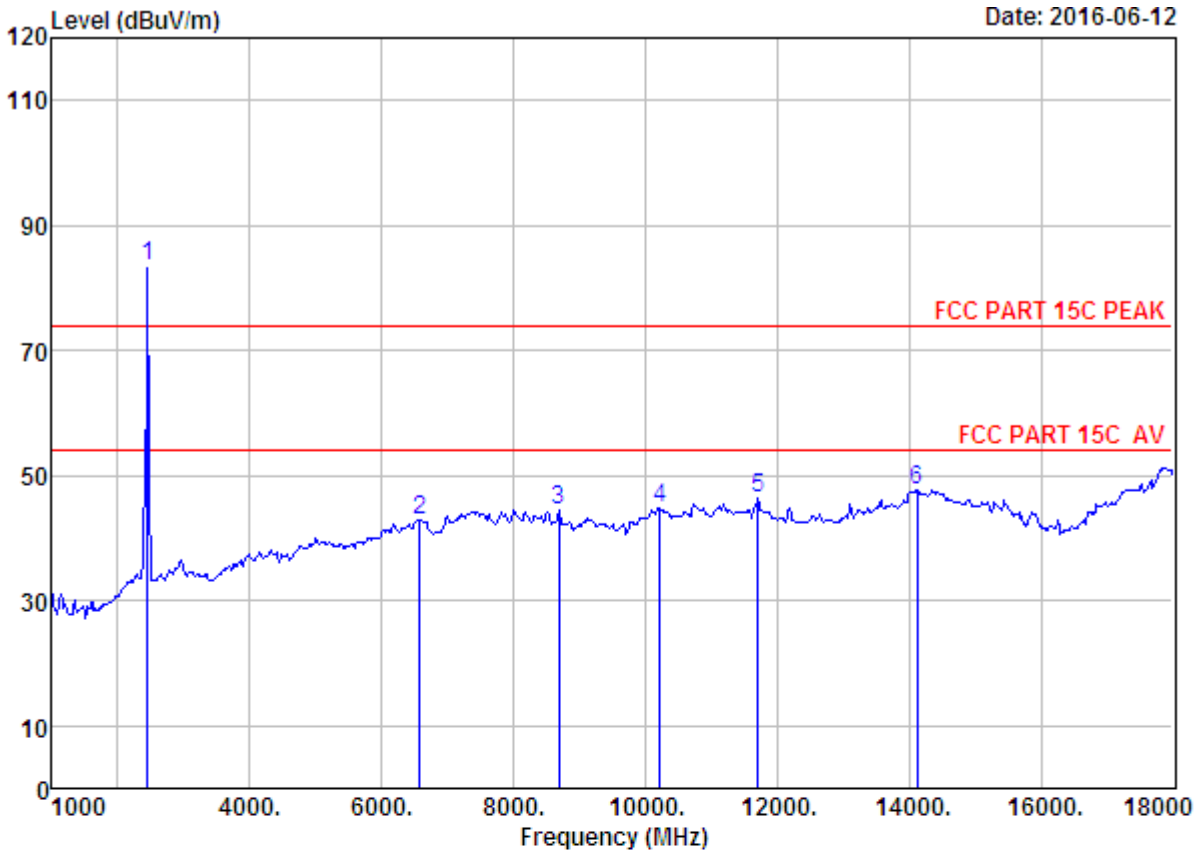
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 12
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2402MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2402.00	27.61	6.62	34.64	83.42	83.01	74.00	-9.01	Peak
2	4825.00	31.28	11.84	35.66	34.91	42.37	74.00	31.63	Peak
3	7290.00	36.54	11.56	34.09	33.09	47.10	74.00	26.90	Peak
4	8667.00	37.30	11.45	33.67	32.93	48.01	74.00	25.99	Peak
5	10792.00	39.30	11.30	33.99	31.24	47.85	74.00	26.15	Peak
6	14464.00	41.85	10.93	33.45	29.48	48.81	74.00	25.19	Peak

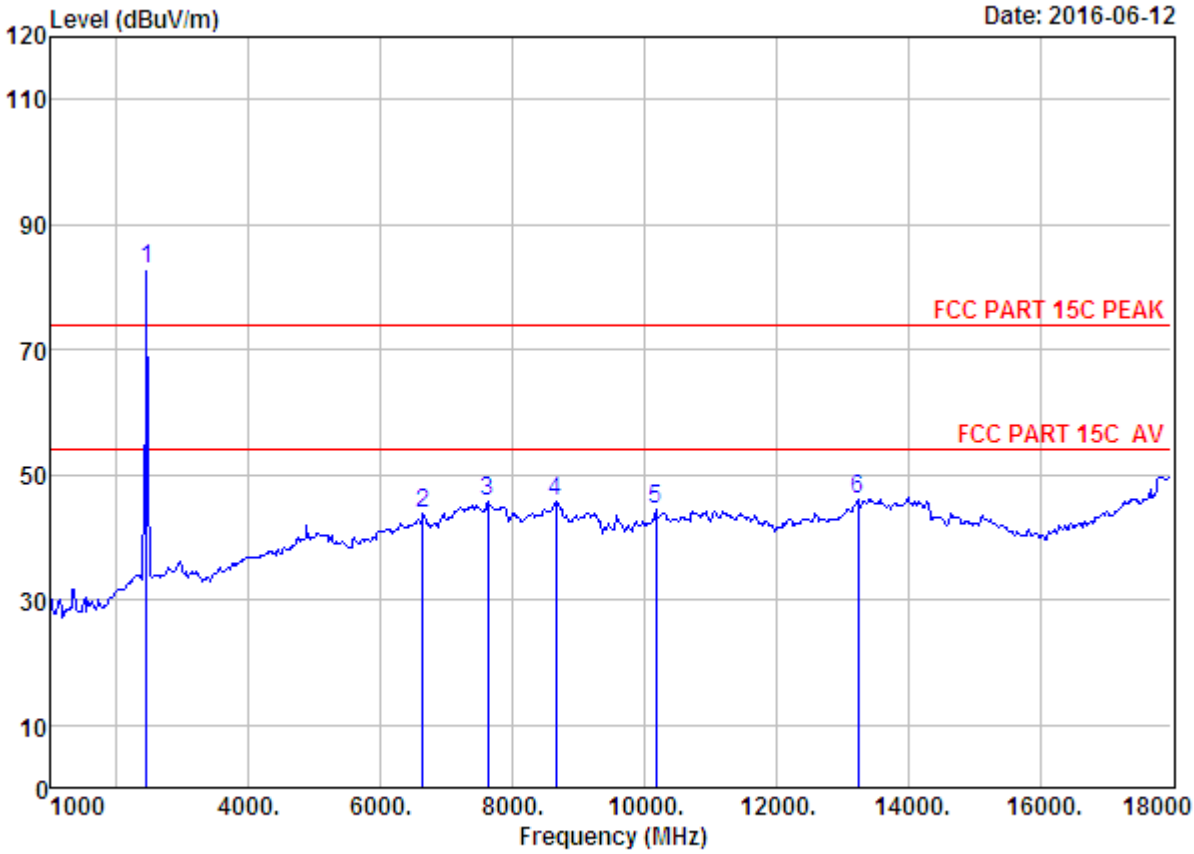
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 15
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.00	27.60	6.67	34.85	84.11	83.53	74.00	-9.53	Peak
2	6576.00	34.42	12.13	34.80	31.23	42.98	74.00	31.02	Peak
3	8684.00	37.32	11.45	33.66	29.42	44.53	74.00	29.47	Peak
4	10214.00	38.48	11.47	34.50	29.32	44.77	74.00	29.23	Peak
5	11710.00	38.96	11.13	33.30	29.47	46.26	74.00	27.74	Peak
6	14124.00	41.57	10.91	33.22	28.46	47.72	74.00	26.28	Peak

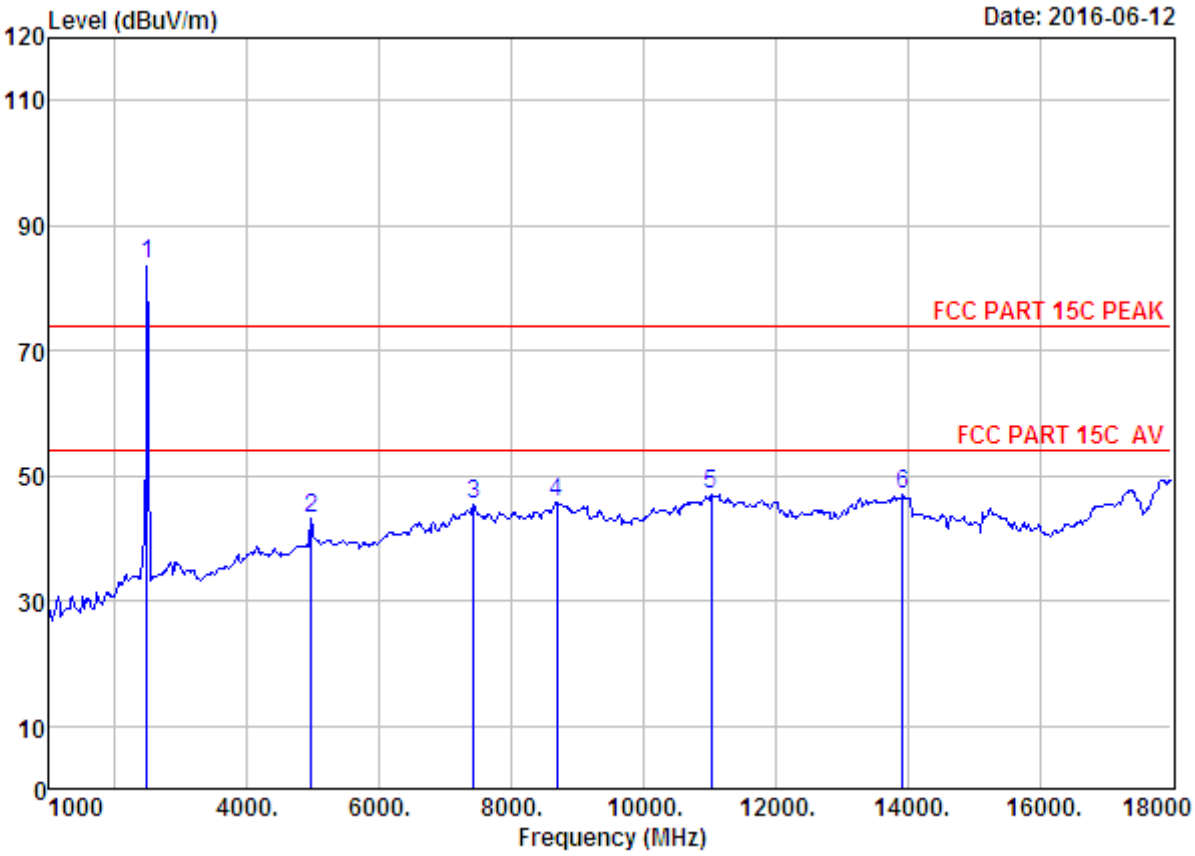
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 16
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.00	27.60	6.67	34.85	83.48	82.90	74.00	-8.90	Peak
2	6644.00	34.48	12.02	34.66	32.12	43.96	74.00	30.04	Peak
3	7630.00	36.41	11.56	34.19	31.83	45.61	74.00	28.39	Peak
4	8650.00	37.27	11.45	33.68	30.65	45.69	74.00	28.31	Peak
5	10180.00	38.42	11.49	34.53	28.96	44.34	74.00	29.66	Peak
6	13240.00	39.46	11.46	32.88	28.08	46.12	74.00	27.88	Peak

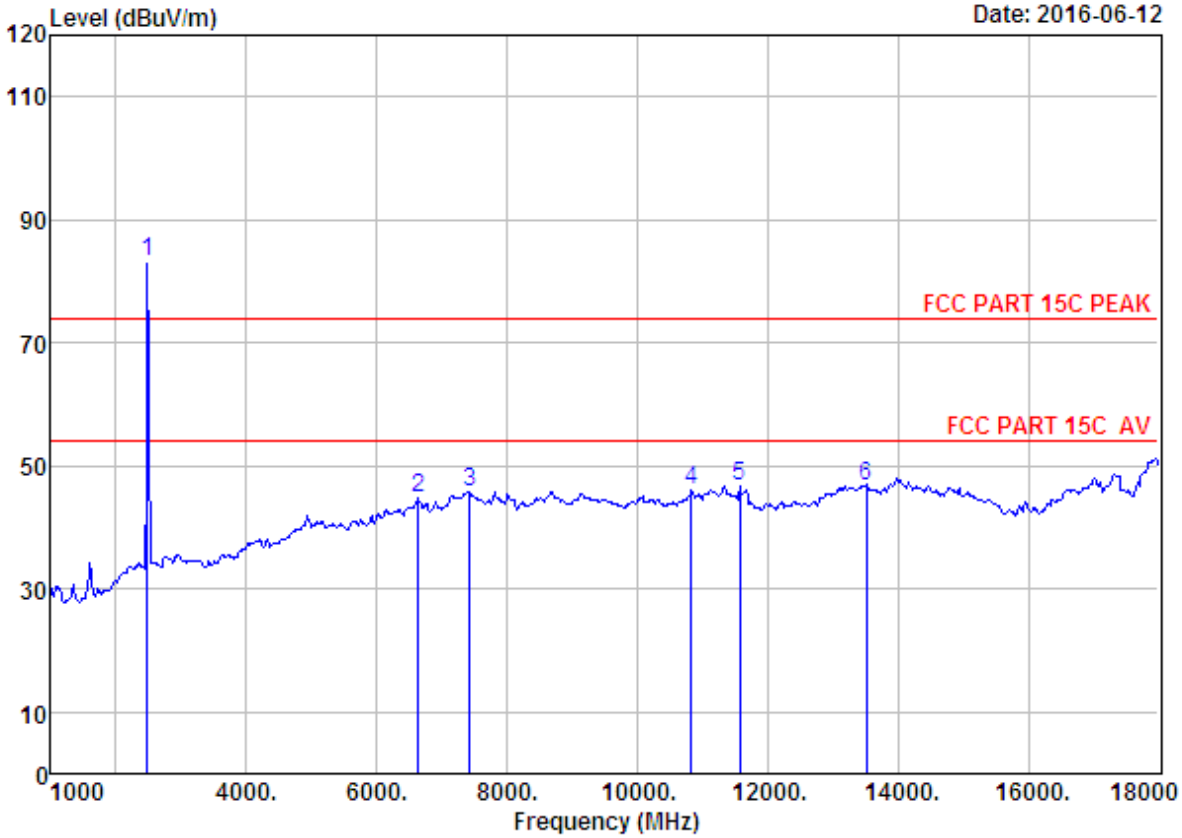
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 17
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.58	6.71	35.11	84.63	83.81	74.00	-9.81	Peak
2	4961.00	31.49	12.44	36.01	35.36	43.28	74.00	30.72	Peak
3	7426.00	36.56	11.60	34.22	31.63	45.57	74.00	28.43	Peak
4	8684.00	37.32	11.45	33.66	30.76	45.87	74.00	28.13	Peak
5	11030.00	39.50	11.27	33.98	30.36	47.15	74.00	26.85	Peak
6	13920.00	41.26	11.00	33.00	27.93	47.19	74.00	26.81	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

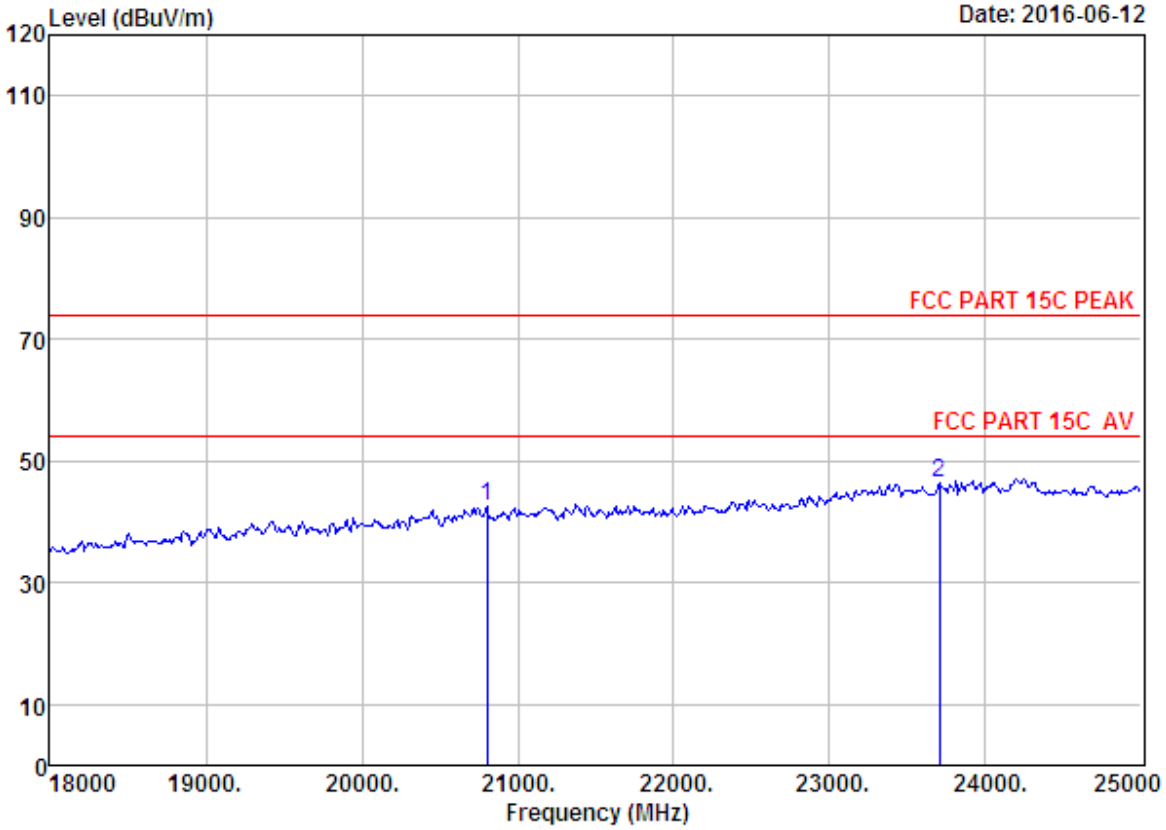


Site no. : 966 1# chamber Data no. : 18
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2480.00	27.58	6.71	35.11	84.13	83.31	74.00	-9.31	Peak
2	6644.00	34.48	12.02	34.66	32.87	44.71	74.00	29.29	Peak
3	7426.00	36.56	11.60	34.22	31.85	45.79	74.00	28.21	Peak
4	10826.00	39.33	11.30	34.00	29.31	45.94	74.00	28.06	Peak
5	11574.00	39.12	10.99	33.27	29.85	46.69	74.00	27.31	Peak
6	13512.00	40.12	11.48	32.64	27.87	46.83	74.00	27.17	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

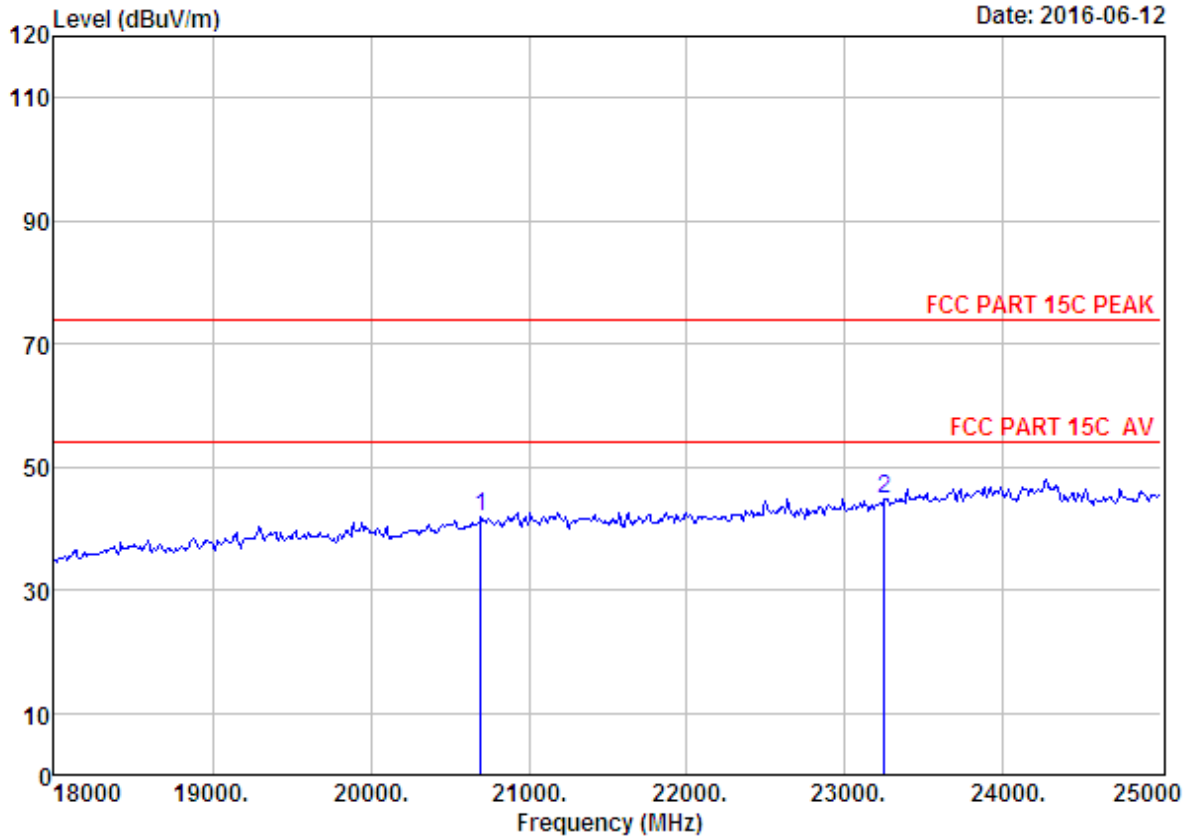
18000MHz – 25000MHz



Site no. : 966 1# chamber Data no. : 29
Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20800.00	46.18	20.04	35.98	12.35	42.59	74.00	31.41	Peak
2	23705.00	45.66	21.78	33.11	12.14	46.47	74.00	27.53	Peak

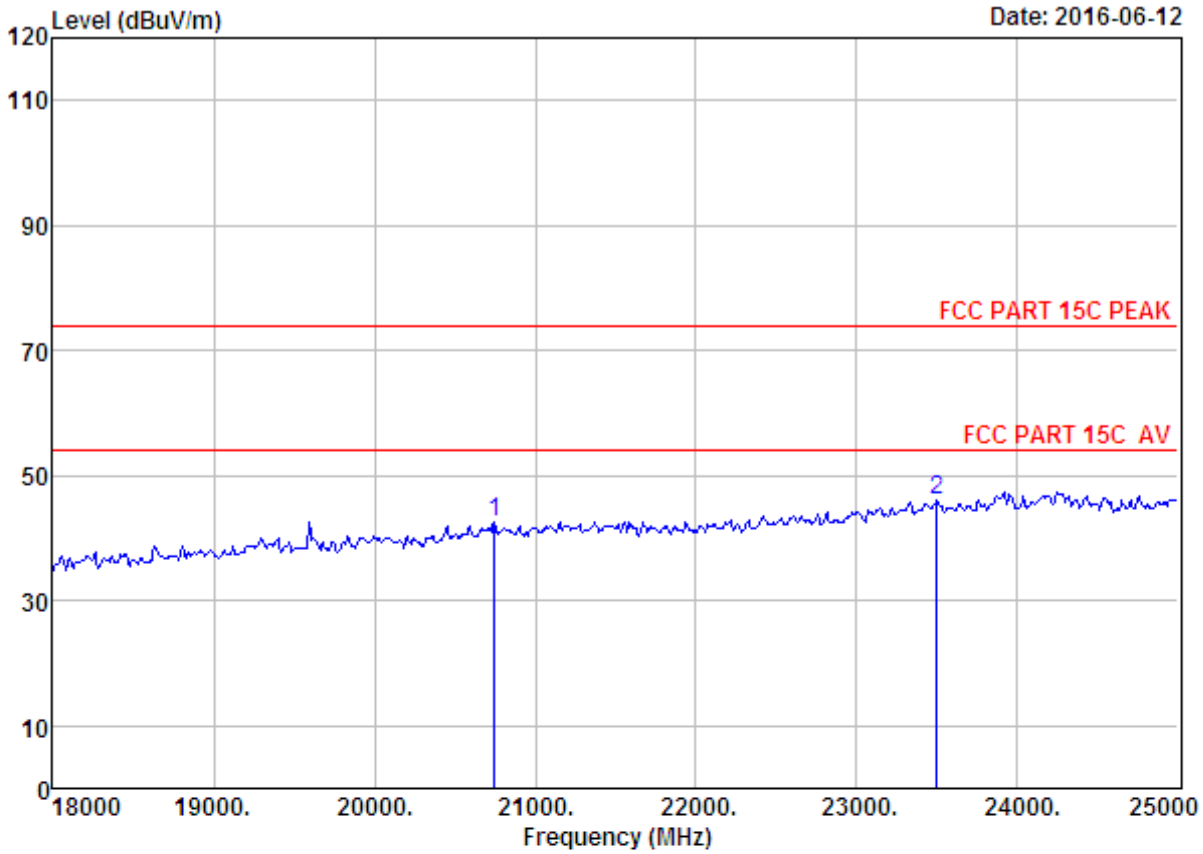
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.      : site                        Data no.  : 30
Dis. / Ant.   : 3m   ANT ABVOE 18G          Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C PEAK
Env. / Ins.   : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer      : Tony
EUT           : Portable Speaker
Power         : DC 3.7V
M/N           : LI-S20128BT
Test Mode     : GFSK TX 2402MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20695.00	46.11	19.99	36.07	11.75	41.78	74.00	32.22	Peak
2	23250.00	45.65	21.37	33.59	11.45	44.88	74.00	29.12	Peak

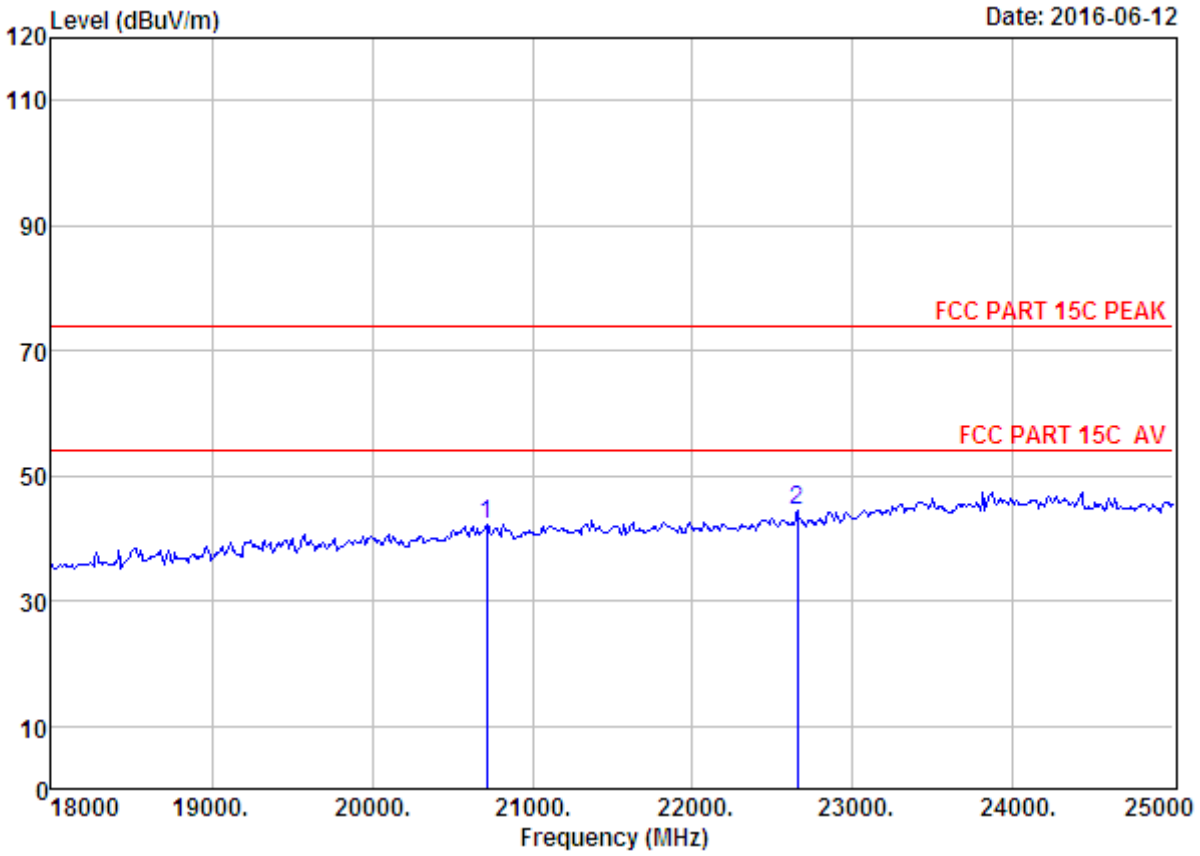
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.       : 966 1# chamber              Data no.   : 31
Dis. / Ant.    : 3m   ANT ABVOE 18G          Ant. pol. : HORIZONTAL
Limit          : FCC PART 15C PEAK
Env. / Ins.    : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer       : Tony
EUT            : Portable Speaker
Power          : DC 3.7V
M/N            : LI-S20128BT
Test Mode      : GFSK TX 2441MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20744.00	46.15	20.02	36.03	12.56	42.70	74.00	31.30	Peak
2	23495.00	45.70	21.60	33.33	11.98	45.95	74.00	28.05	Peak

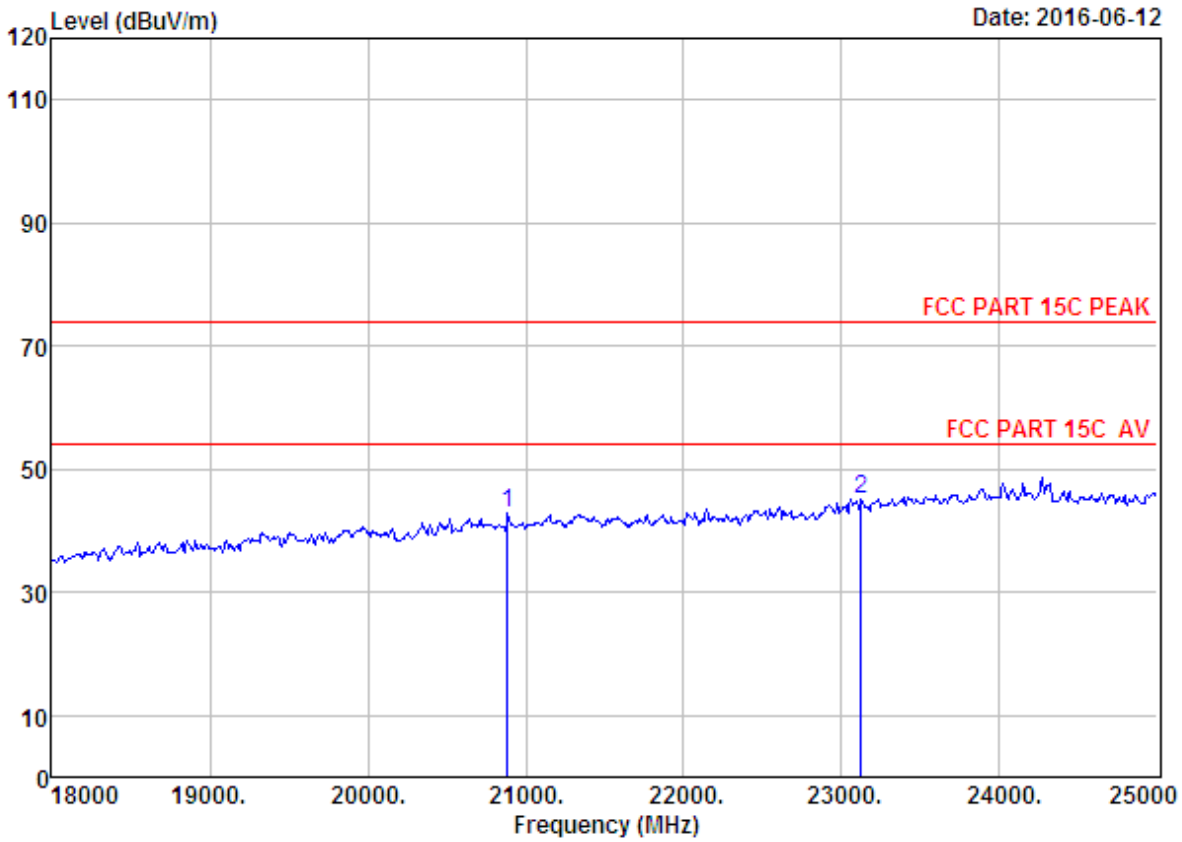
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.       : 966 1# chamber              Data no.   : 32
Dis. / Ant.    : 3m   ANT ABVOE 18G          Ant. pol. : VERTICAL
Limit          : FCC PART 15C PEAK
Env. / Ins.    : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer       : Tony
EUT            : Portable Speaker
Power          : DC 3.7V
M/N            : LI-S20128BT
Test Mode      : GFSK TX 2441MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20716.00	0.00	20.00	36.05	58.35	42.30	74.00	31.70	Peak
2	22655.00	0.00	20.94	34.22	57.68	44.40	74.00	29.60	Peak

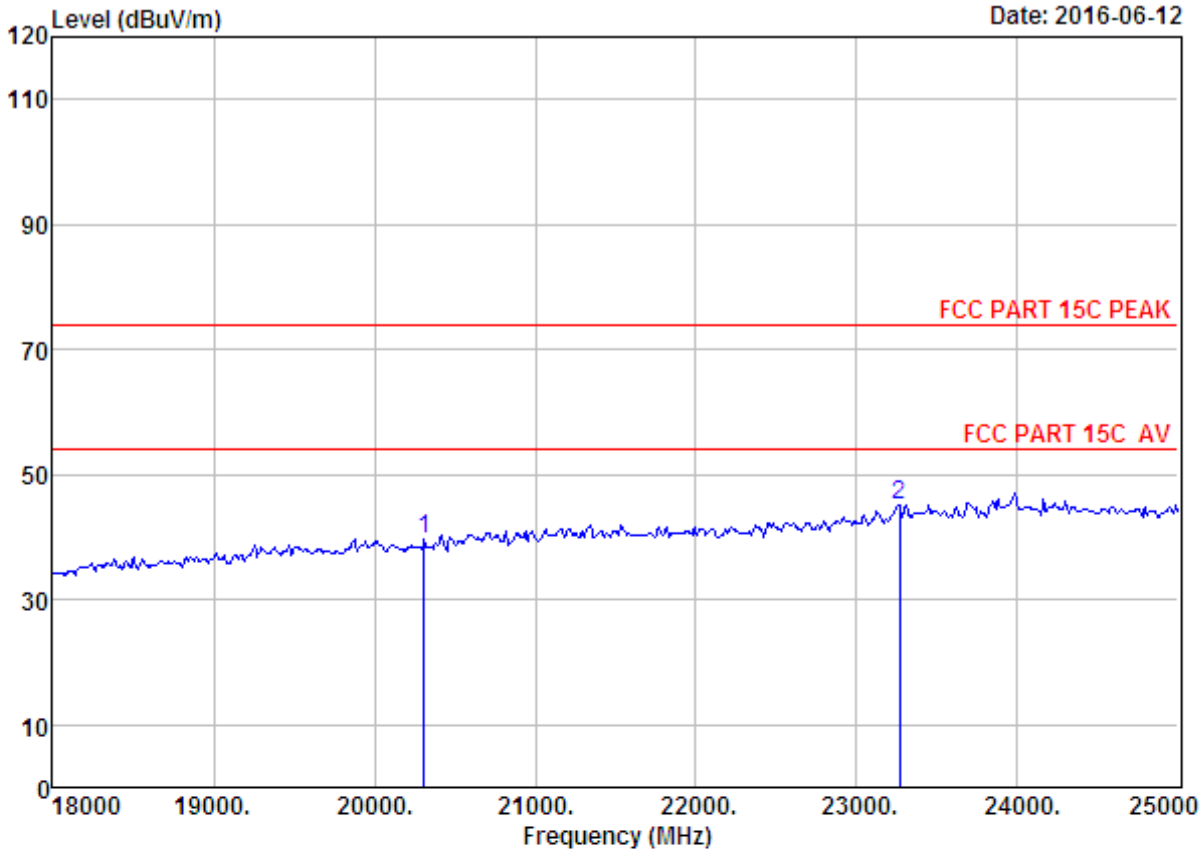
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 33
Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20884.00	46.23	20.08	35.91	12.38	42.78	74.00	31.22	Peak
2	23124.00	45.63	21.26	33.72	12.07	45.24	74.00	28.76	Peak

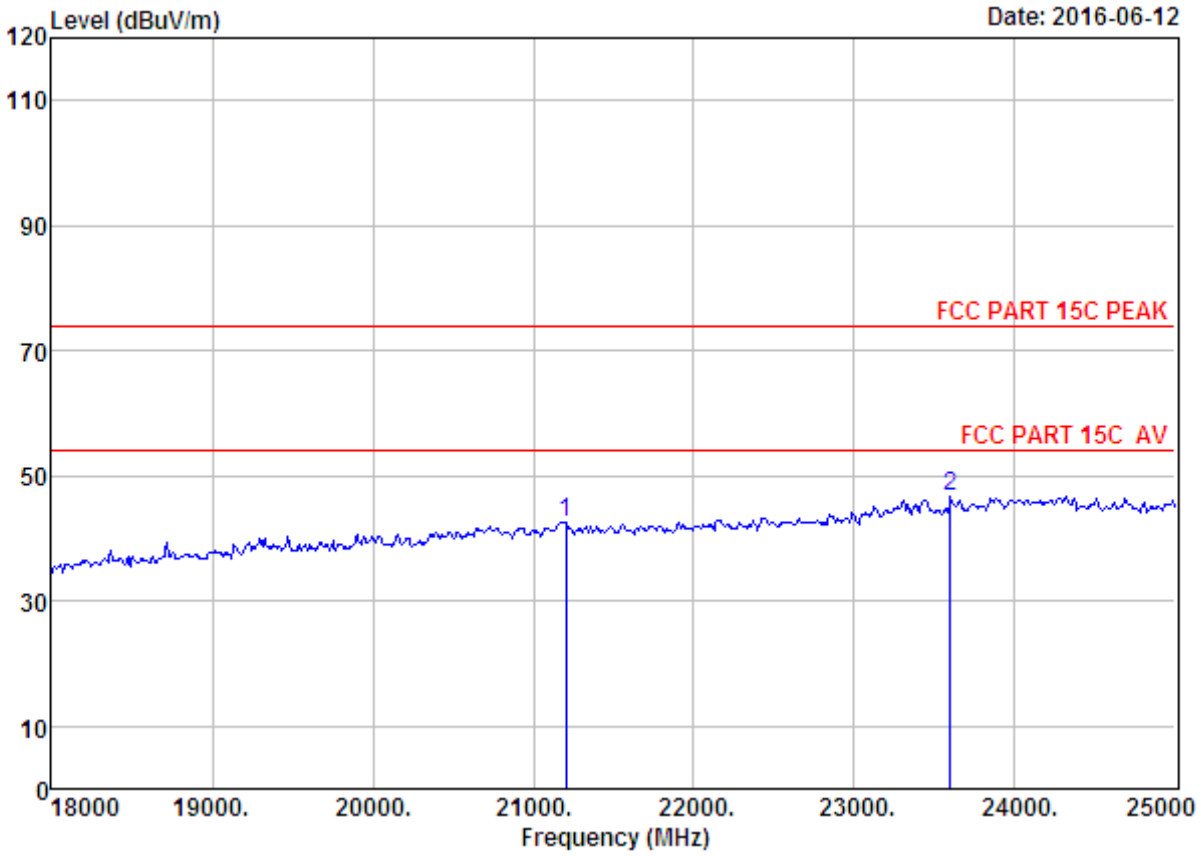
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 34
Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20310.00	46.04	19.82	36.43	10.32	39.75	74.00	34.25	Peak
2	23264.00	45.65	21.39	33.56	11.73	45.21	74.00	28.79	Peak

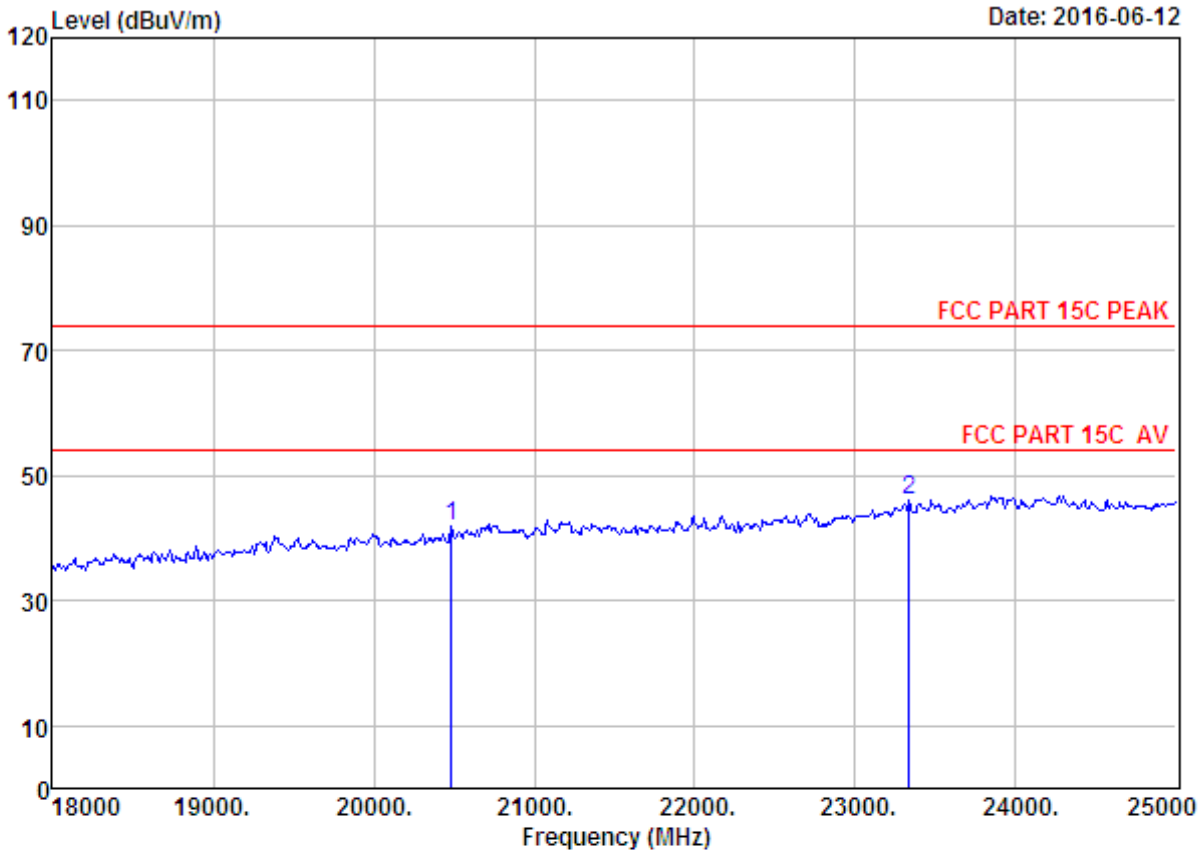
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.       : 966 1# chamber              Data no.   : 35
Dis. / Ant.    : 3m   ANT ABVOE 18G          Ant. pol. : HORIZONTAL
Limit          : FCC PART 15C PEAK
Env. / Ins.    : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer       : Tony
EUT            : Portable Speaker
Power          : DC 3.7V
M/N            : LI-S20128BT
Test Mode      : (π/4)DQPSK TX 2402MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	21206.00	46.17	20.22	35.62	11.91	42.68	74.00	31.32	Peak
2	23600.00	45.68	21.69	33.22	12.51	46.66	74.00	27.34	Peak

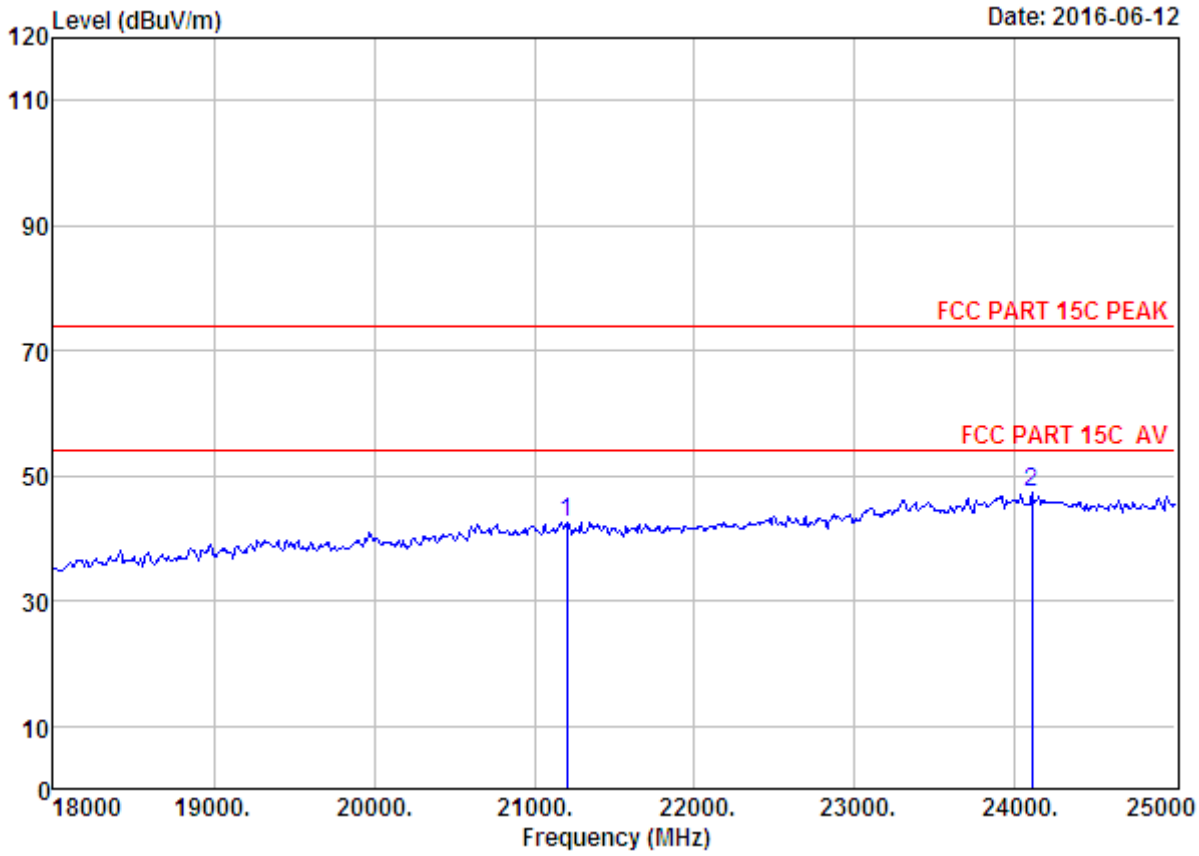
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.       : 966 1# chamber              Data no.  : 36
Dis. / Ant.    : 3m   ANT ABOVE 18G          Ant. pol. : VERTICAL
Limit          : FCC PART 15C PEAK
Env. / Ins.    : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer       : Tony
EUT            : Portable Speaker
Power          : DC 3.7V
M/N            : LI-S20128BT
Test Mode      : (π/4)DQPSK TX 2402MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	20485.00	46.00	19.90	36.27	12.17	41.80	74.00	32.20	Peak
2	23334.00	45.67	21.45	33.51	12.49	46.10	74.00	27.90	Peak

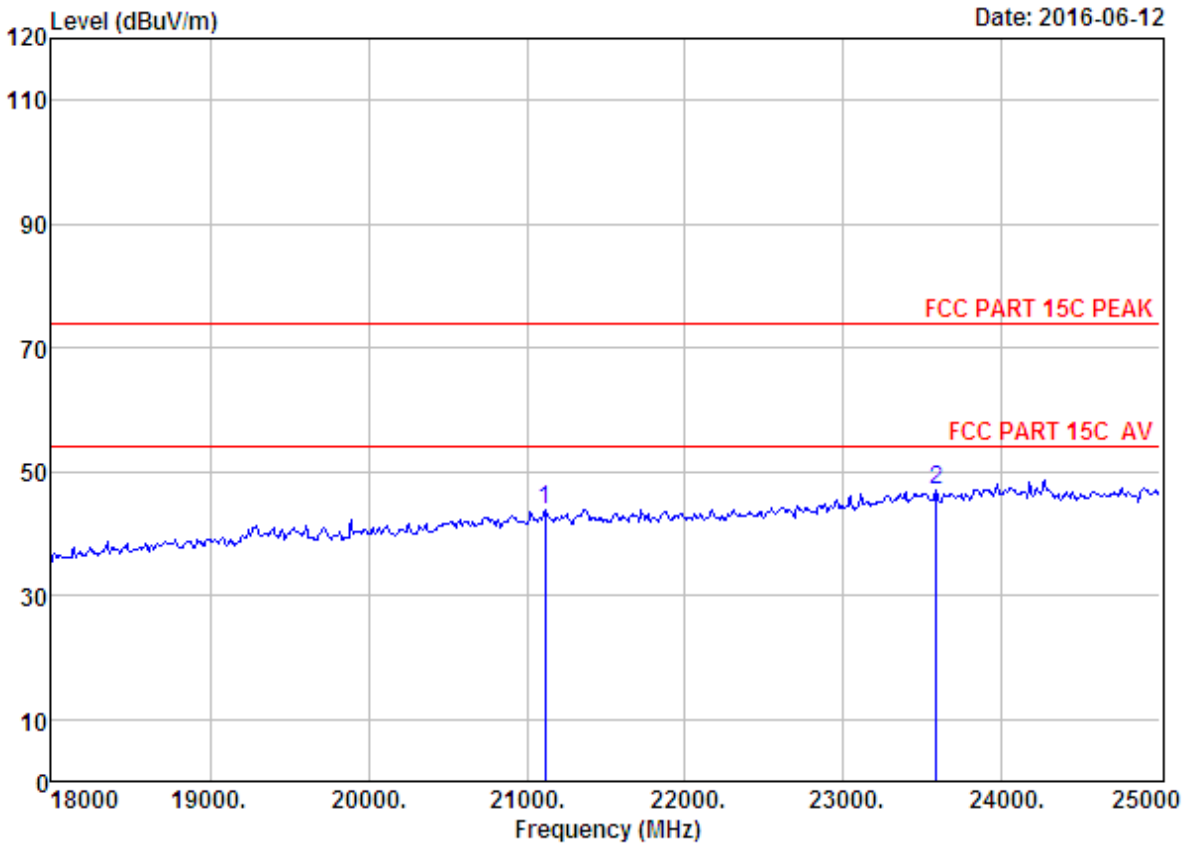
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 37
Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2441MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	21206.00	46.17	20.22	35.62	11.88	42.65	74.00	31.35	Peak
2	24104.00	45.62	22.10	32.95	12.48	47.25	74.00	26.75	Peak

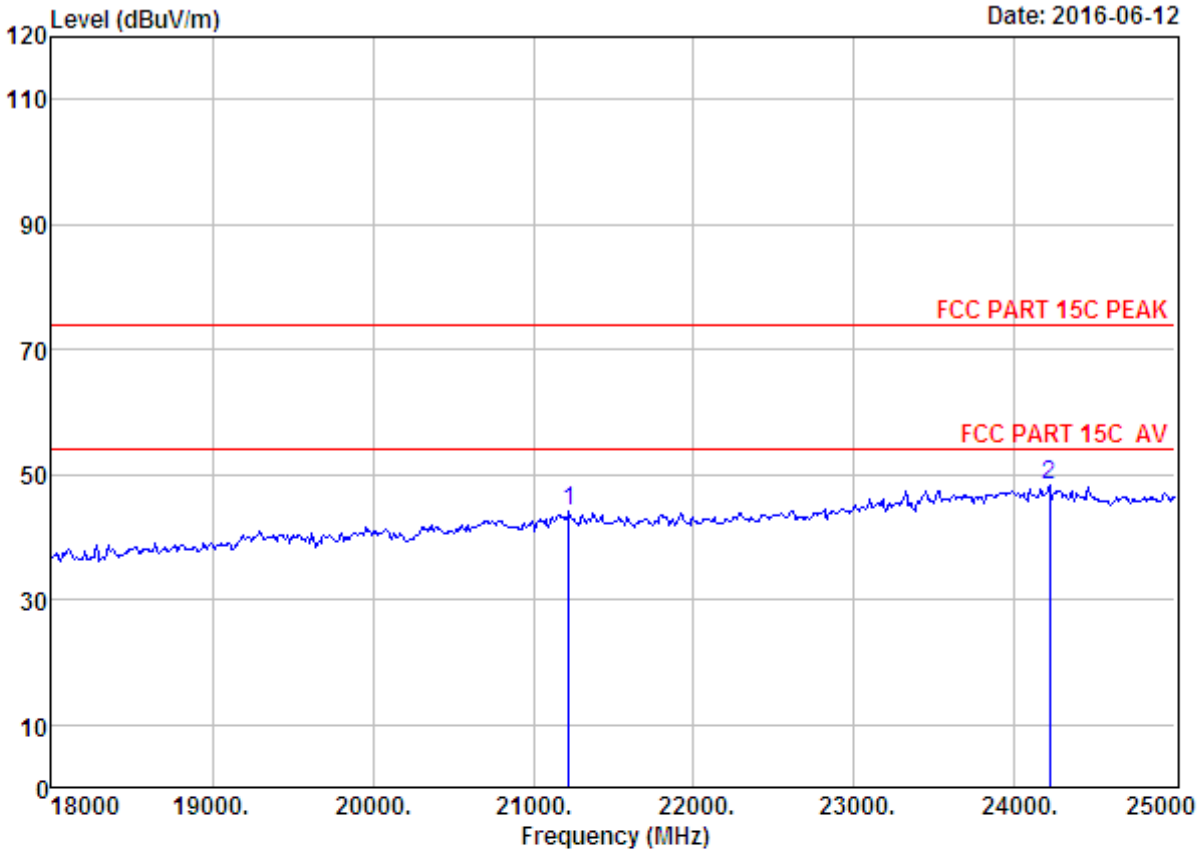
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.       : 966 1# chamber              Data no.   : 38
Dis. / Ant.    : 3m   ANT ABVOE 18G          Ant. pol. : HORIZONTAL
Limit          : FCC PART 15C PEAK
Env. / Ins.    : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer       : Tony
EUT            : Portable Speaker
Power          : DC 3.7V
M/N            : LI-S20128BT
Test Mode      : (π/4)DQPSK TX 2441MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	21115.00	46.22	20.18	35.69	13.25	43.96	74.00	30.04	Peak
2	23586.00	45.68	21.68	33.25	12.99	47.10	74.00	26.90	Peak

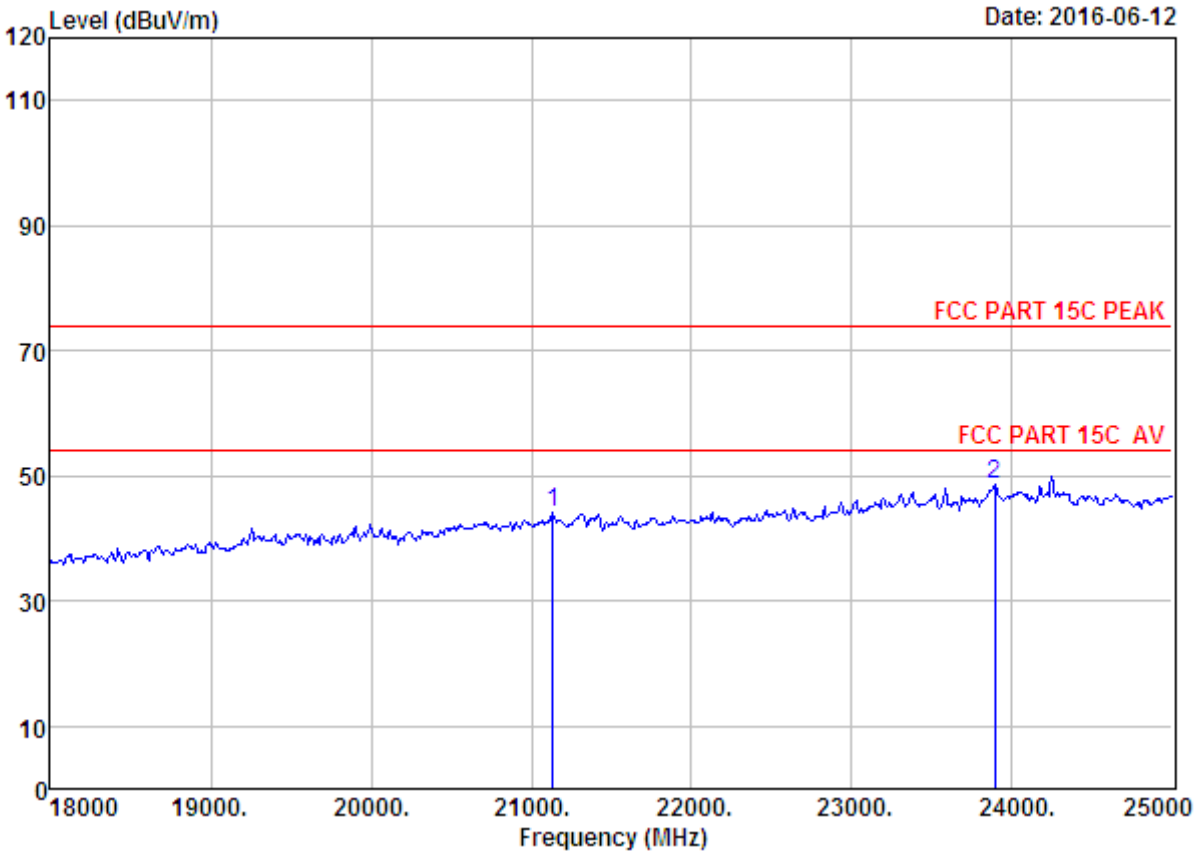
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 39
Dis. / Ant. : 3m ANT ABVOE 18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	21220.00	46.17	20.23	35.60	13.34	44.14	74.00	29.86	Peak
2	24216.00	45.65	22.17	33.15	13.73	48.40	74.00	25.60	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 40
Dis. / Ant. : 3m ANT ABOVE 18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	21136.00	46.21	20.19	35.69	13.49	44.20	74.00	29.80	Peak
2	23894.00	45.62	21.95	32.90	13.88	48.55	74.00	25.45	Peak

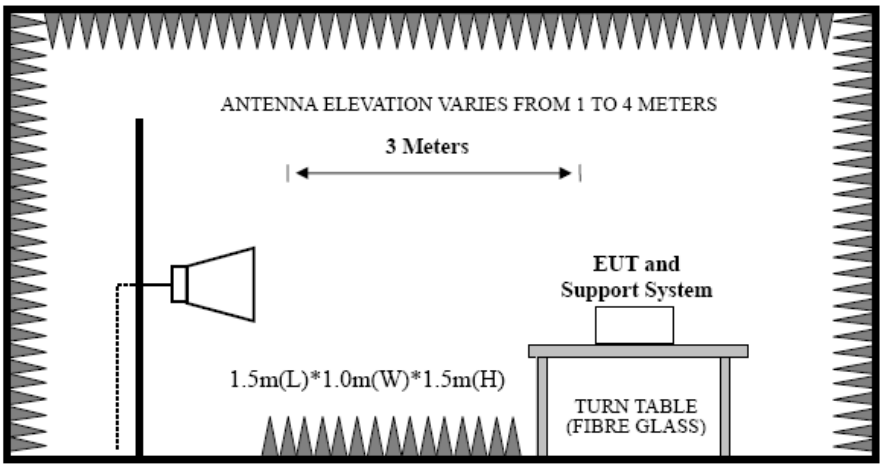
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

9. BAND EDGE COMPLIANCE

9.1. Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.2. Block Diagram of Test setup



9.3. Test Procedure

EUT was placed on a turn table, which is 1.5 m high above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.

Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of emissions
Peak : RBW = 1MHz, VBW = 1MHz, Detector=PEAK detector, Sweep time = auto.
AV : RBW = 1MHz, VBW = 10Hz, Detector=PEAK detector, Sweep time = auto.

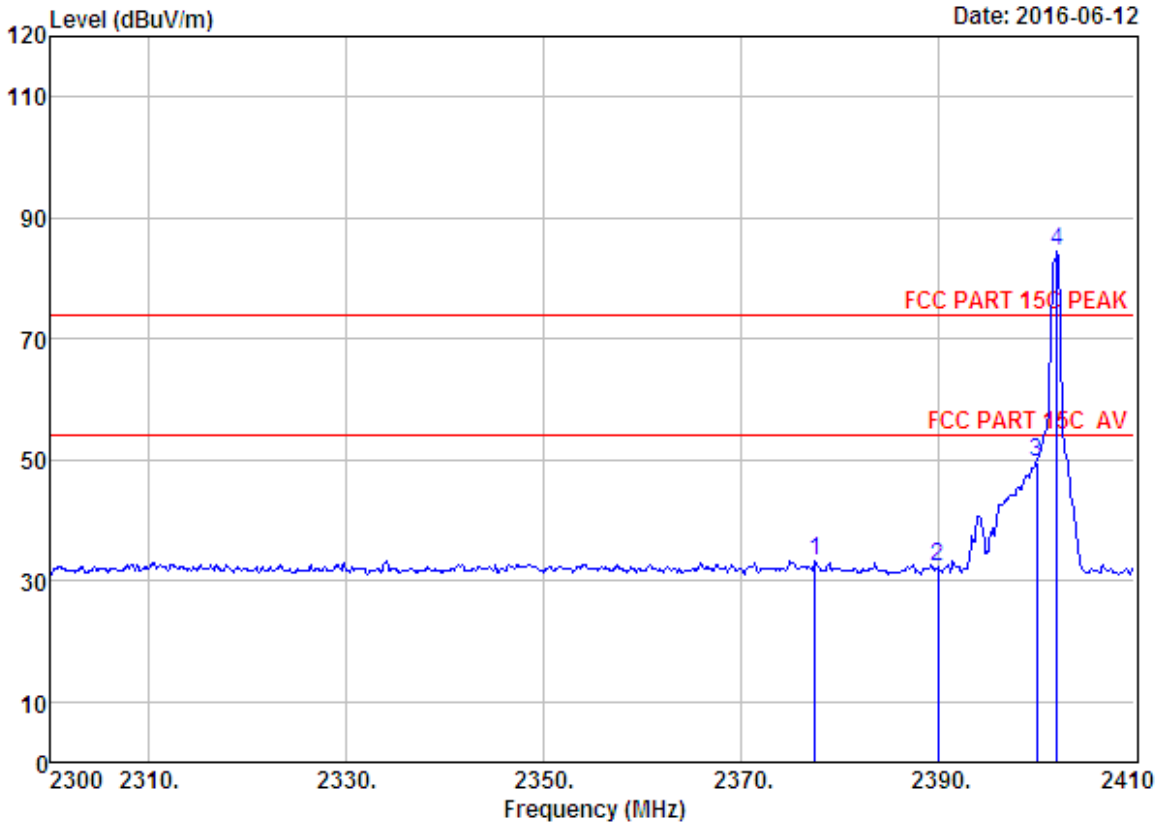
9.4. Test Result

EUT: Portable Speaker M/N: LI-S20128BT
Power: DC 3.7V
Test date: 2016-06-12 Test site: 3m Chamber Tested by: Tony Tang
Test mode: Tx Mode (Hopping On & No Hopping)
Pass

Note: 1、For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

2、 The frequency 2402MHz 、2441MHz and 2480MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.

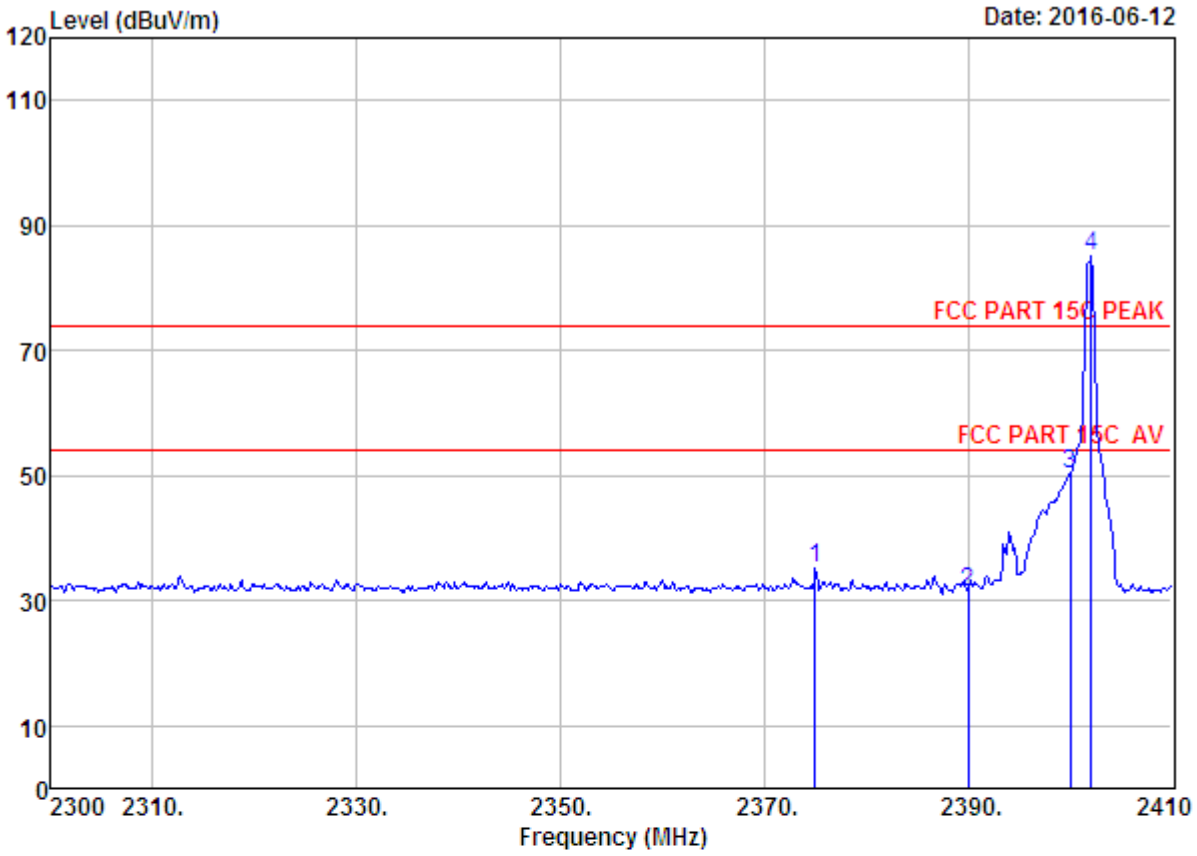
9.5. Test Data



Site no. : 966 1# chamber Data no. : 3
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz (No Hopping)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2377.55	27.64	6.60	34.59	33.63	33.28	74.00	40.72	Peak
2	2390.00	27.64	6.62	34.62	32.59	32.23	74.00	41.77	Peak
3	2400.00	27.61	6.62	34.64	49.88	49.47	74.00	24.53	Peak
4	2402.08	27.61	6.62	34.64	84.81	84.40	74.00	-10.40	Peak

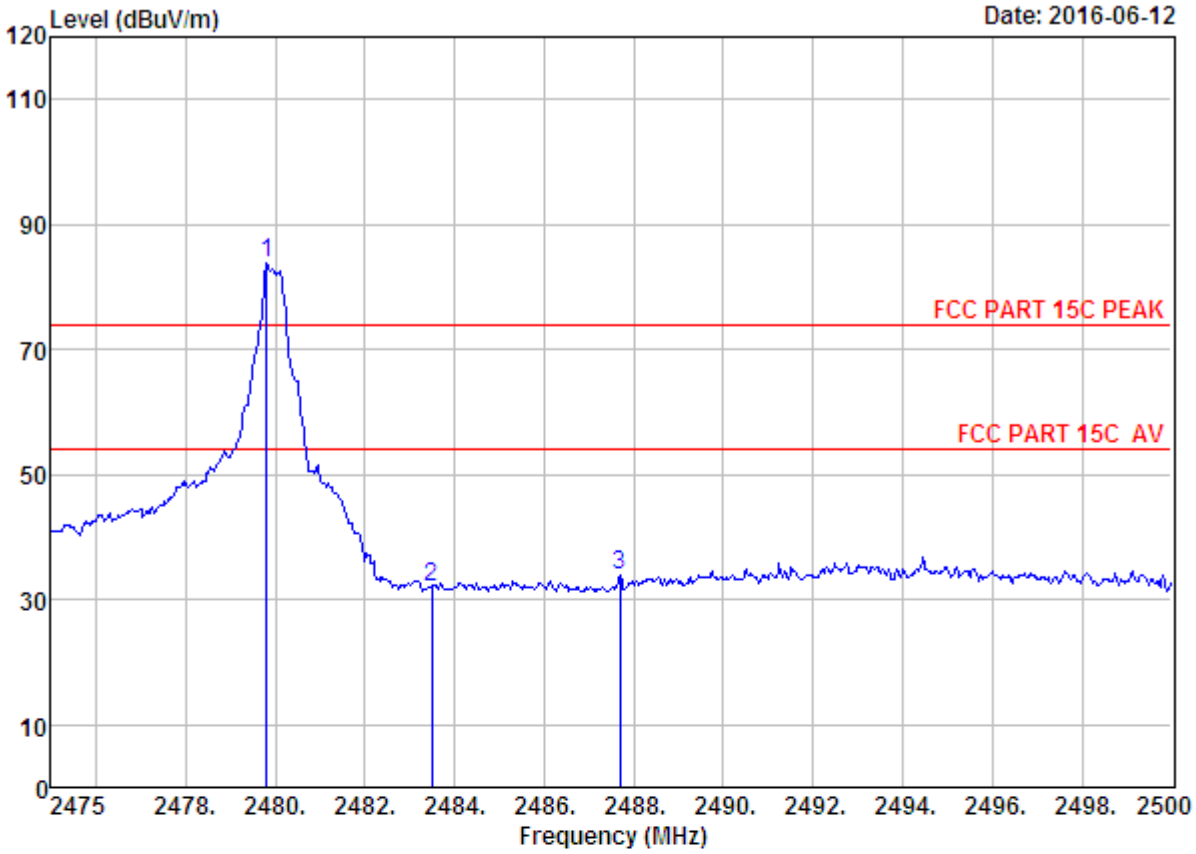
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 4
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz (No Hopping)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.02	27.64	6.60	34.59	35.63	35.28	74.00	38.72	Peak
2	2390.00	27.64	6.62	34.62	31.86	31.50	74.00	42.50	Peak
3	2400.00	27.61	6.62	34.64	50.60	50.19	74.00	23.81	Peak
4	2402.08	27.61	6.62	34.64	85.45	85.04	74.00	-11.04	Peak

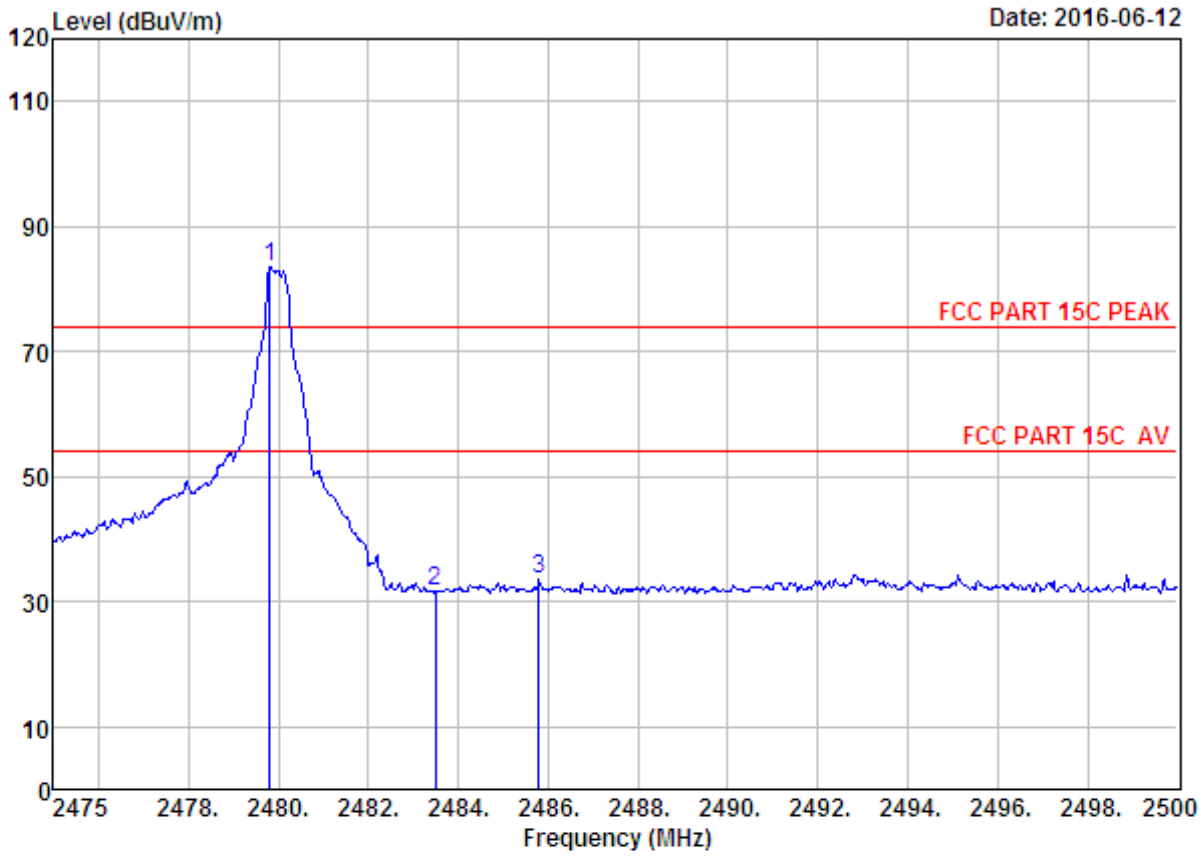
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 9
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz (No Hopping)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.80	27.58	6.71	35.11	84.68	83.86	74.00	-9.86	Peak
2	2483.50	27.58	6.71	35.11	32.90	32.08	74.00	41.92	Peak
3	2487.70	27.58	6.73	35.11	34.84	34.04	74.00	39.96	Peak

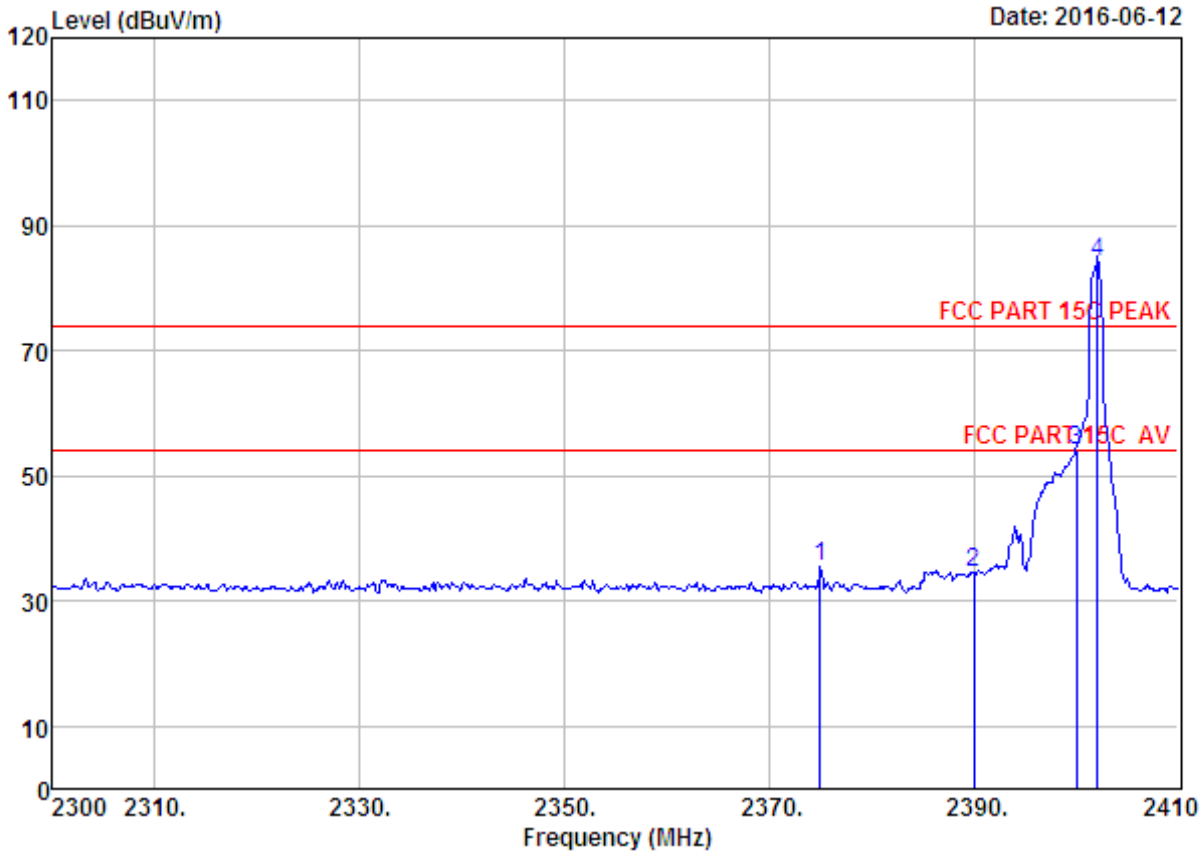
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.      : 966 1# chamber              Data no.  : 10
Dis. / Ant.   : 3m   ANT 1-18G              Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C PEAK
Env. / Ins.   : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer      : Tony
EUT           : Portable Speaker
Power         : DC 3.7V
M/N           : LI-S20128BT
Test Mode     : GFSK TX 2480MHz (No Hopping)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.80	27.58	6.71	35.11	84.41	83.59	74.00	-9.59	Peak
2	2483.50	27.58	6.71	35.11	32.39	31.57	74.00	42.43	Peak
3	2485.80	27.58	6.71	35.11	34.29	33.47	74.00	40.53	Peak

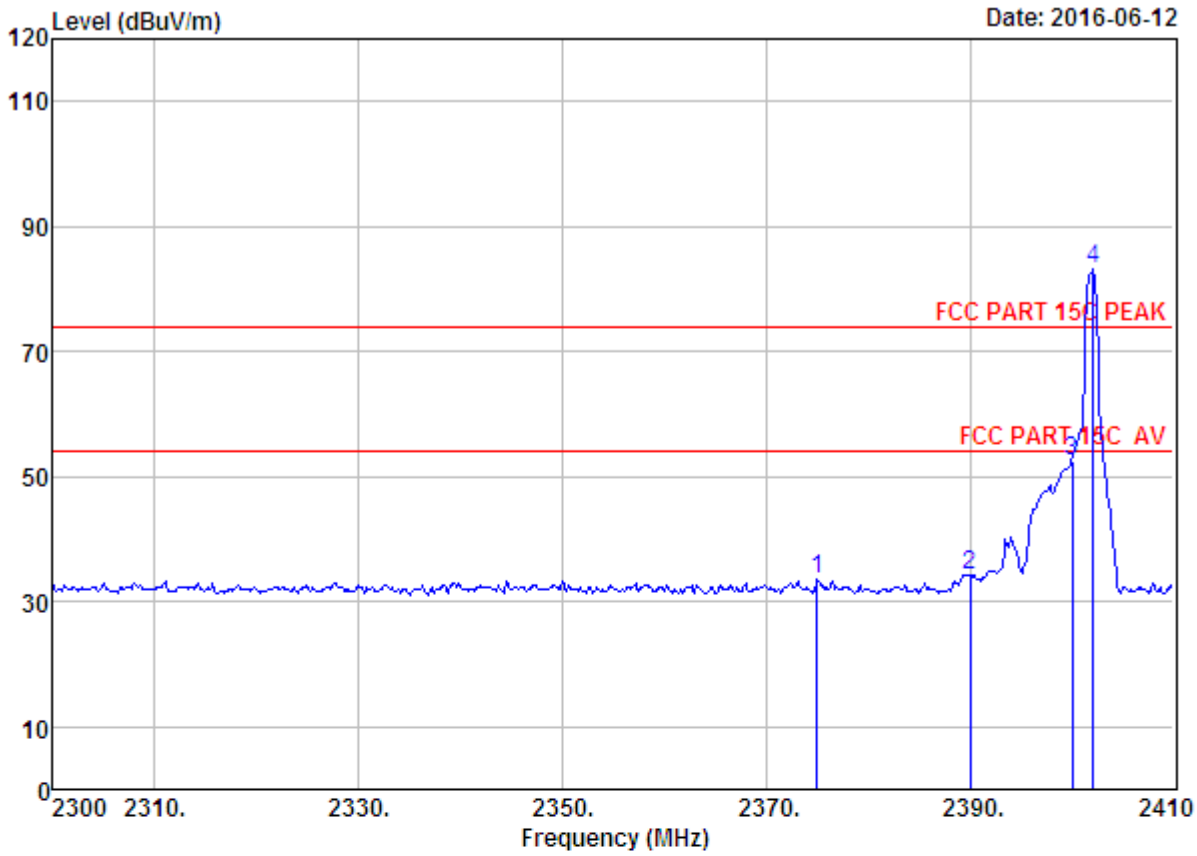
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.      : 966 1# chamber              Data no.   : 13
Dis. / Ant.   : 3m   ANT 1-18G              Ant. pol. : VERTICAL
Limit         : FCC PART 15C PEAK
Env. / Ins.   : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer      : Tony
EUT           : Portable Speaker
Power         : DC 3.7V
M/N           : LI-S20128BT
Test Mode     : (π/4)DQPSK TX 2402MHz (No Hopping)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.02	27.64	6.60	34.59	35.95	35.60	74.00	38.40	Peak
2	2390.00	27.64	6.62	34.62	35.01	34.65	74.00	39.35	Peak
3	2400.00	27.61	6.62	34.64	54.47	54.06	74.00	19.94	Peak
4	2402.08	27.61	6.62	34.64	84.49	84.08	74.00	-10.08	Peak

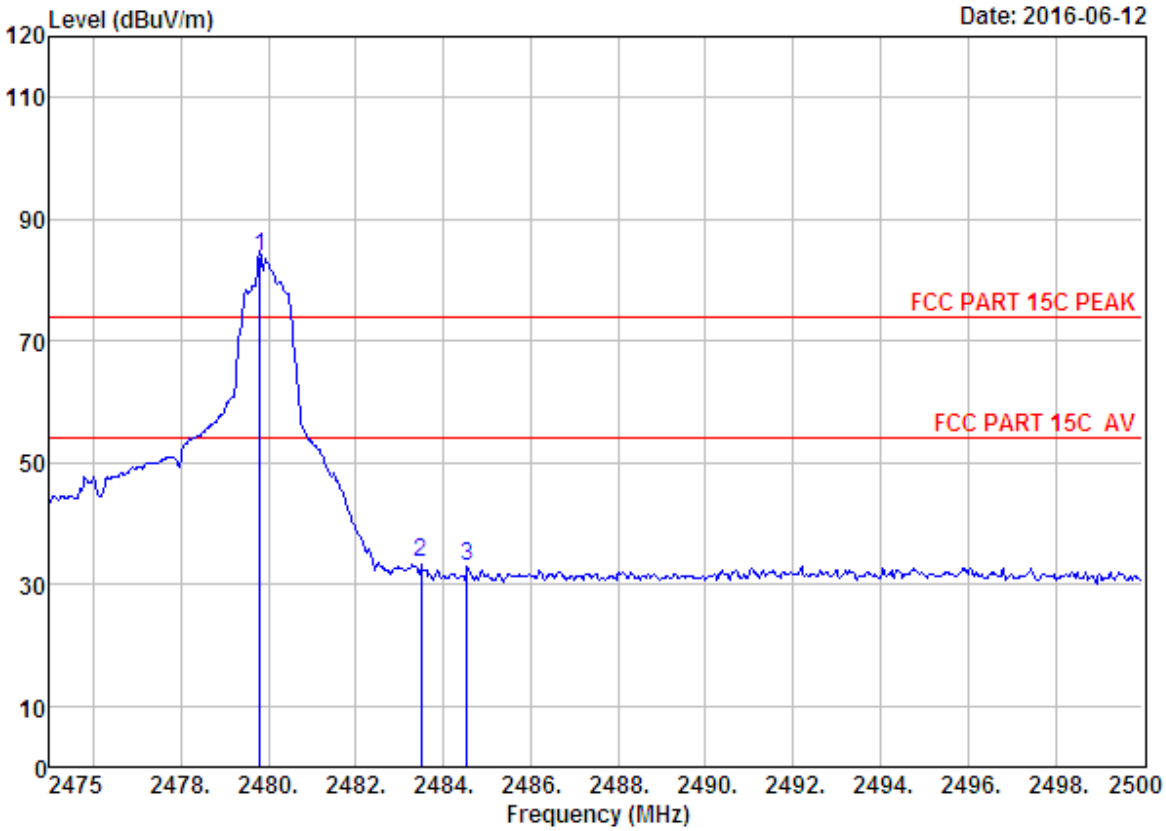
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 14
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2402MHz (No Hopping)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.02	27.64	6.60	34.59	33.97	33.62	74.00	40.38	Peak
2	2390.00	27.64	6.62	34.62	34.49	34.13	74.00	39.87	Peak
3	2400.00	27.61	6.62	34.64	52.94	52.53	74.00	21.47	Peak
4	2402.08	27.61	6.62	34.64	83.54	83.13	74.00	-9.13	Peak

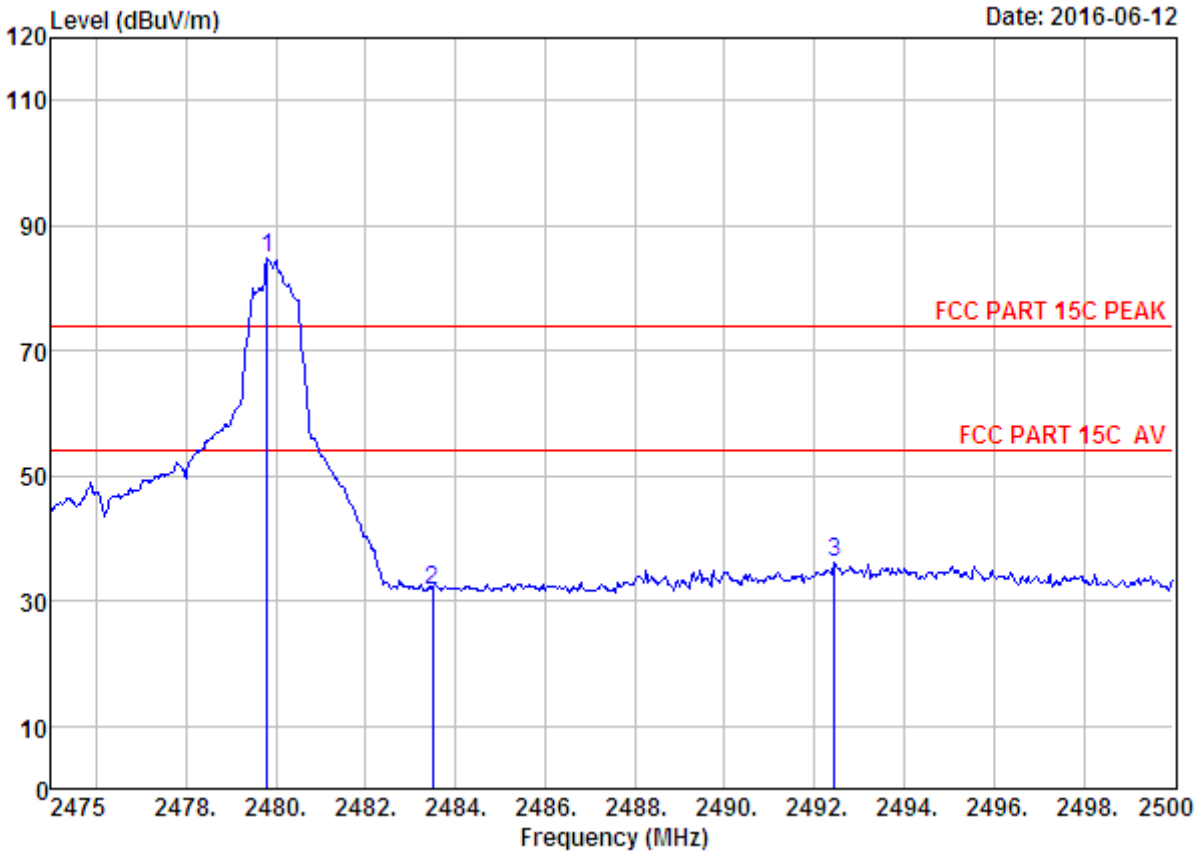
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.      : 966 1# chamber              Data no.  : 19
Dis. / Ant.   : 3m   ANT 1-18G              Ant. pol. : HORIZONTAL
Limit         : FCC PART 15C PEAK
Env. / Ins.   : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer      : Tony
EUT           : Portable Speaker
Power         : DC 3.7V
M/N           : LI-S20128BT
Test Mode     : (π/4)DQPSK TX 2480MHz (No Hopping)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.80	27.58	6.71	35.11	84.76	83.94	74.00	-9.94	Peak
2	2483.50	27.58	6.71	35.11	34.49	33.67	74.00	40.33	Peak
3	2484.55	27.58	6.71	35.11	33.82	33.00	74.00	41.00	Peak

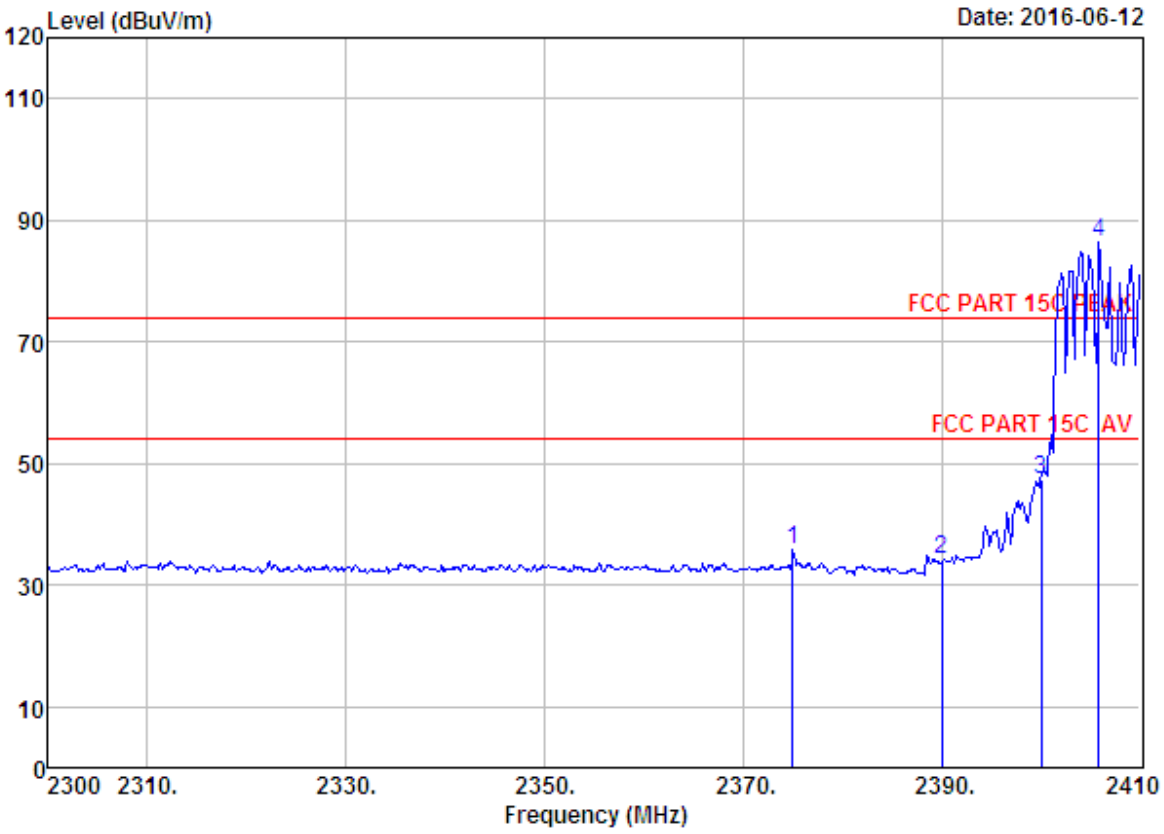
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.




```
Site no.       : 966 1# chamber              Data no.   : 20
Dis. / Ant.    : 3m   ANT 1-18G              Ant. pol. : VERTICAL
Limit          : FCC PART 15C PEAK
Env. / Ins.    : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer       : Tony
EUT            : Portable Speaker
Power          : DC 3.7V
M/N            : LI-S20128BT
Test Mode      : (π/4)DQPSK TX 2480MHz (No Hopping)
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.80	27.58	6.71	35.11	85.70	84.88	74.00	-10.88	Peak
2	2483.50	27.58	6.71	35.11	32.63	31.81	74.00	42.19	Peak
3	2492.45	27.58	6.73	35.24	37.04	36.11	74.00	37.89	Peak

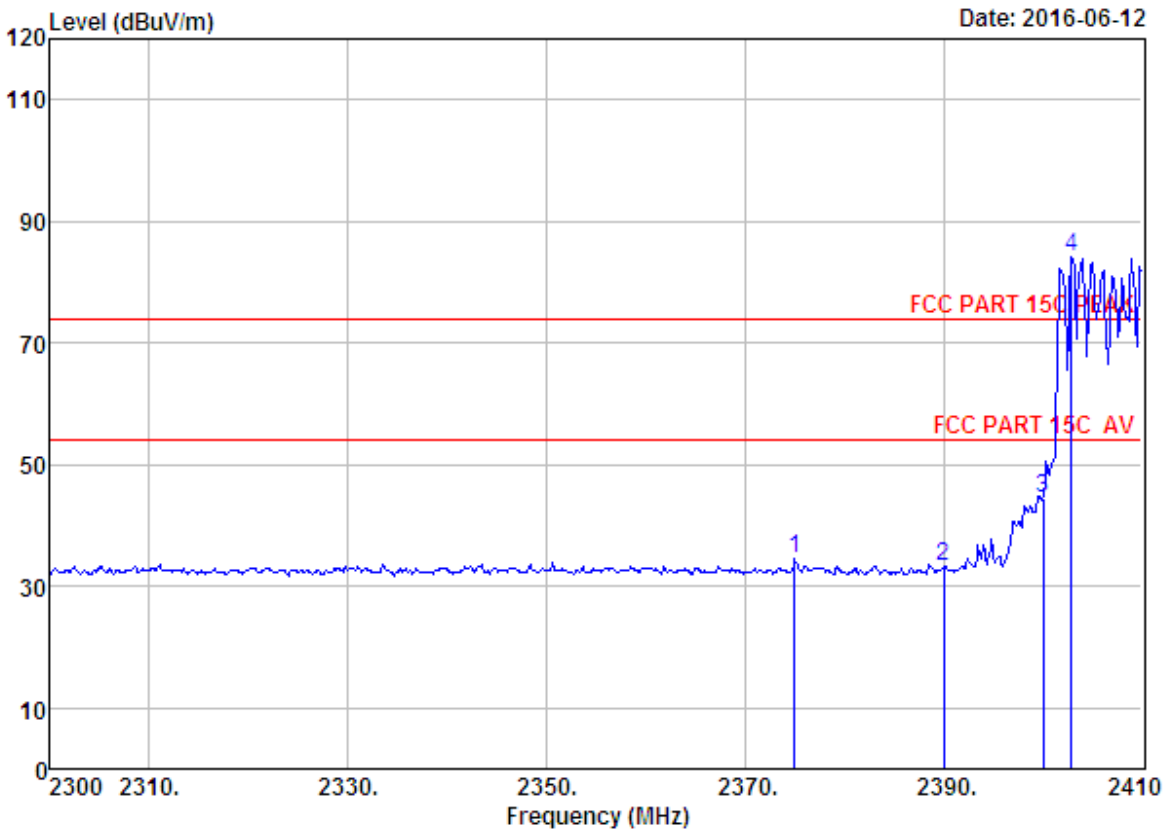
```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
         2. The emission levels that are 20dB below the official
            limit are not reported.
```



Site no. : 966 1# chamber Data no. : 21
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.02	27.64	6.60	34.59	36.16	35.81	74.00	38.19	Peak
2	2390.00	27.64	6.62	34.62	34.68	34.32	74.00	39.68	Peak
3	2400.00	27.61	6.62	34.64	47.64	47.23	74.00	26.77	Peak
4	2405.82	27.61	6.64	34.64	86.90	86.51	74.00	-12.51	Peak

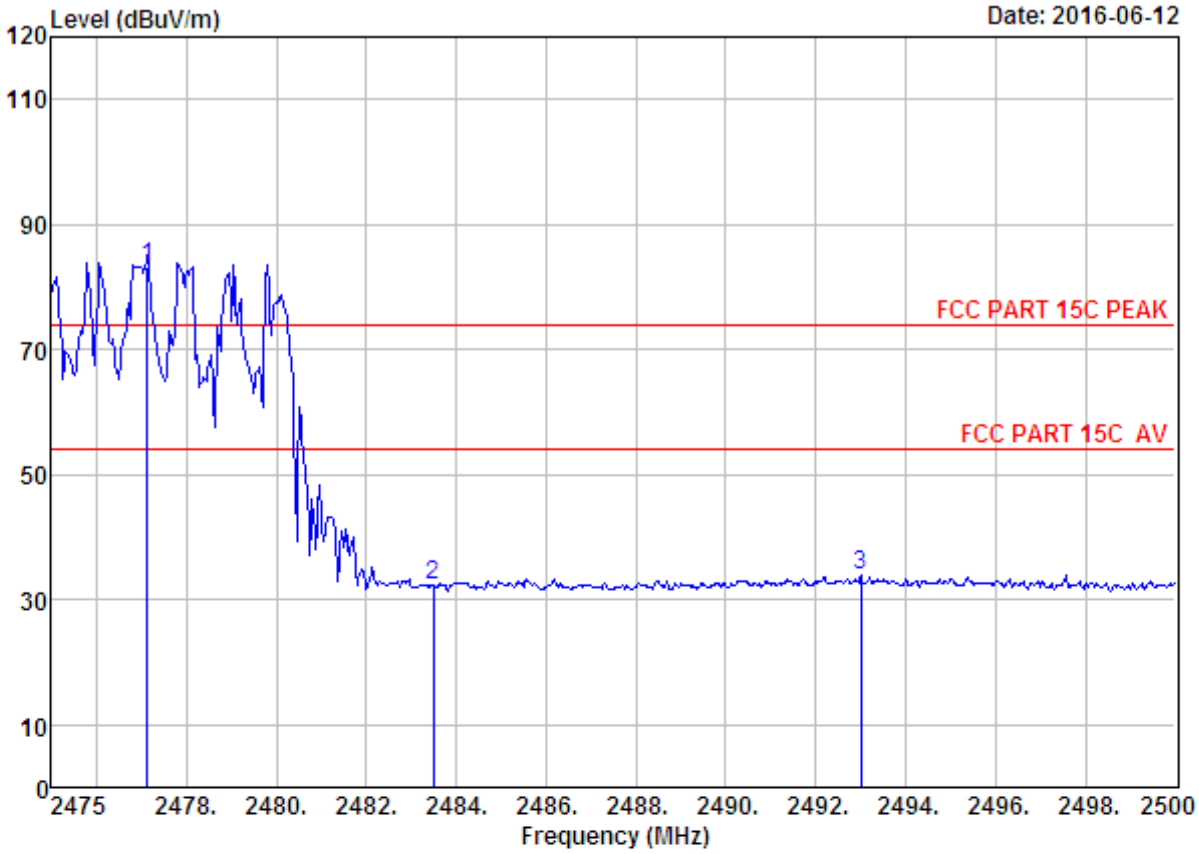
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 22
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2402MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.02	27.64	6.60	34.59	34.95	34.60	74.00	39.40	Peak
2	2390.00	27.64	6.62	34.62	33.51	33.15	74.00	40.85	Peak
3	2400.00	27.61	6.62	34.64	44.86	44.45	74.00	29.55	Peak
4	2402.85	27.61	6.64	34.64	84.51	84.12	74.00	-10.12	Peak

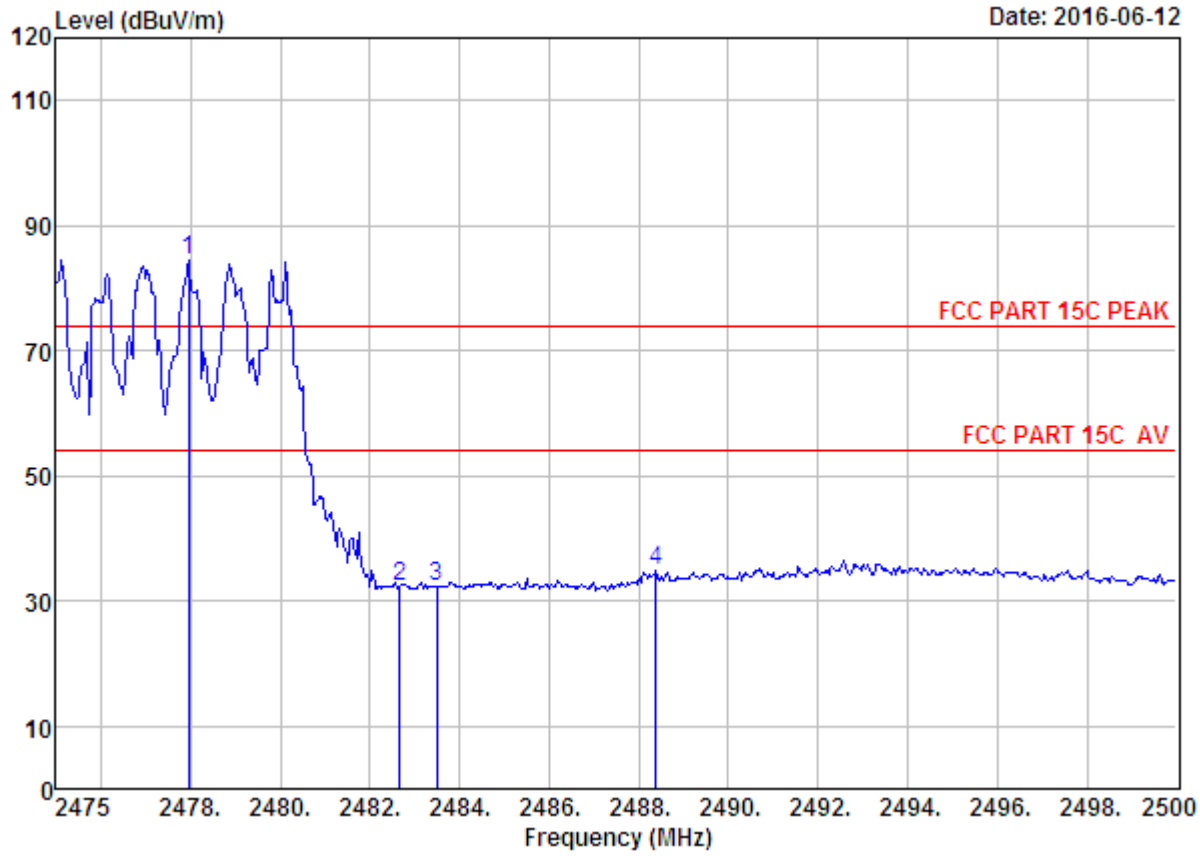
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 23
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2477.13	27.58	6.71	35.11	84.03	83.21	74.00	-9.21	Peak
2	2483.50	27.58	6.71	35.11	33.12	32.30	74.00	41.70	Peak
3	2493.00	27.58	6.73	35.24	34.72	33.79	74.00	40.21	Peak

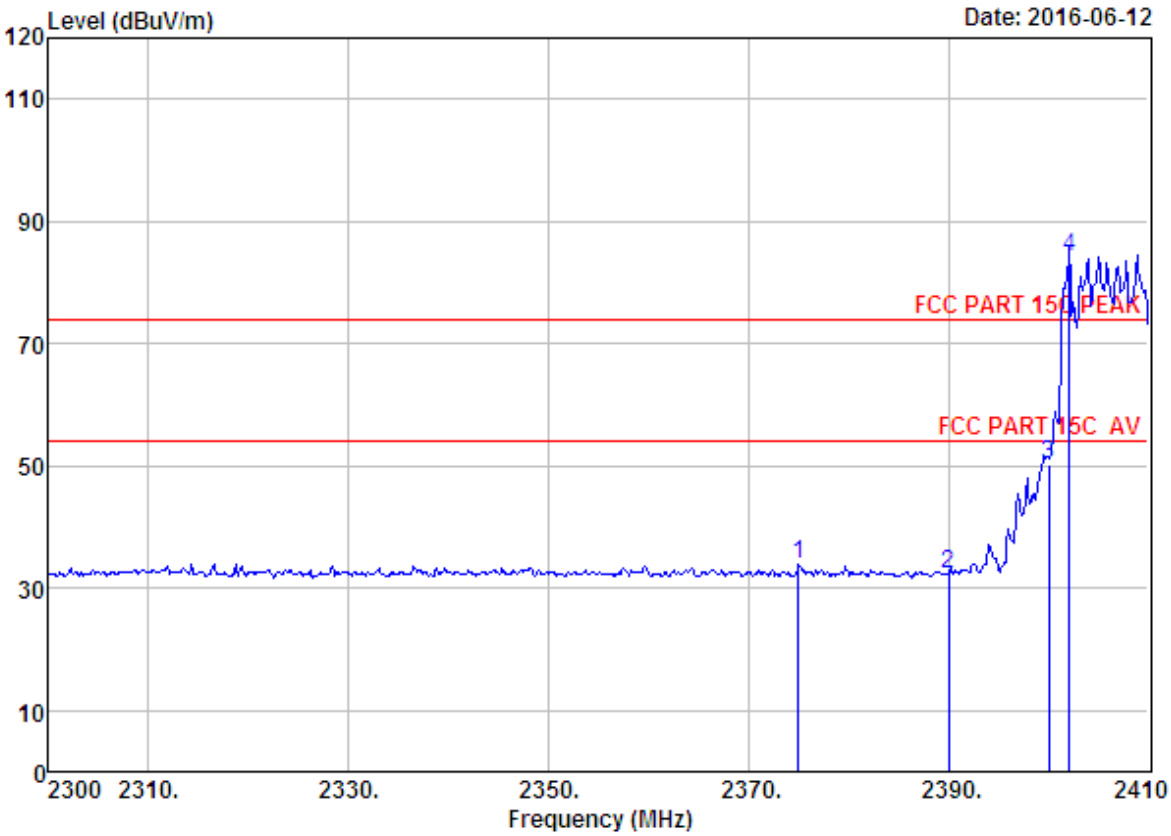
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 24
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : GFSK TX 2480MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2477.95	27.58	6.71	35.11	85.36	84.54	74.00	-10.54	Peak
2	2482.68	27.58	6.71	35.11	33.21	32.39	74.00	41.61	Peak
3	2483.50	27.58	6.71	35.11	33.13	32.31	74.00	41.69	Peak
4	2488.38	27.58	6.73	35.11	35.68	34.88	74.00	39.12	Peak

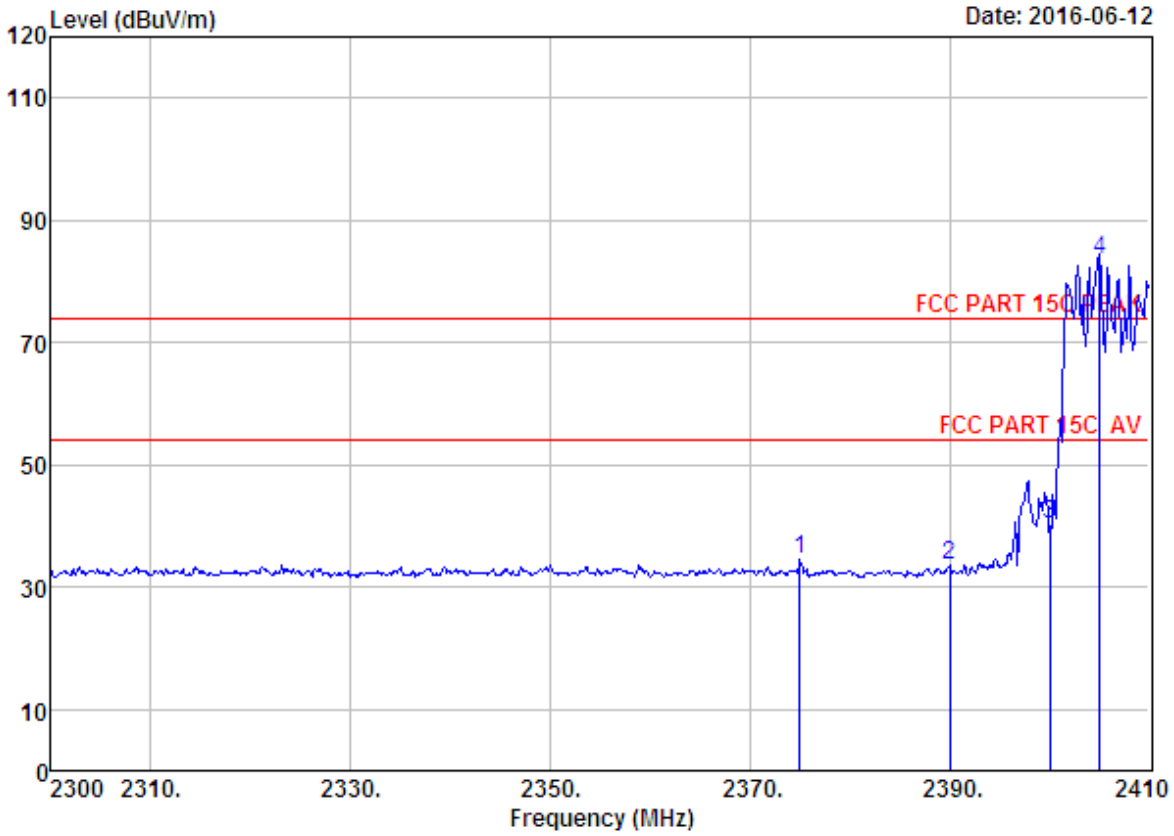
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 25
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2402MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.02	27.64	6.60	34.59	34.35	34.00	74.00	40.00	Peak
2	2390.00	27.64	6.62	34.62	32.72	32.36	74.00	41.64	Peak
3	2400.00	27.61	6.62	34.64	50.79	50.38	74.00	23.62	Peak
4	2402.08	27.61	6.62	34.64	84.55	84.14	74.00	-10.14	Peak

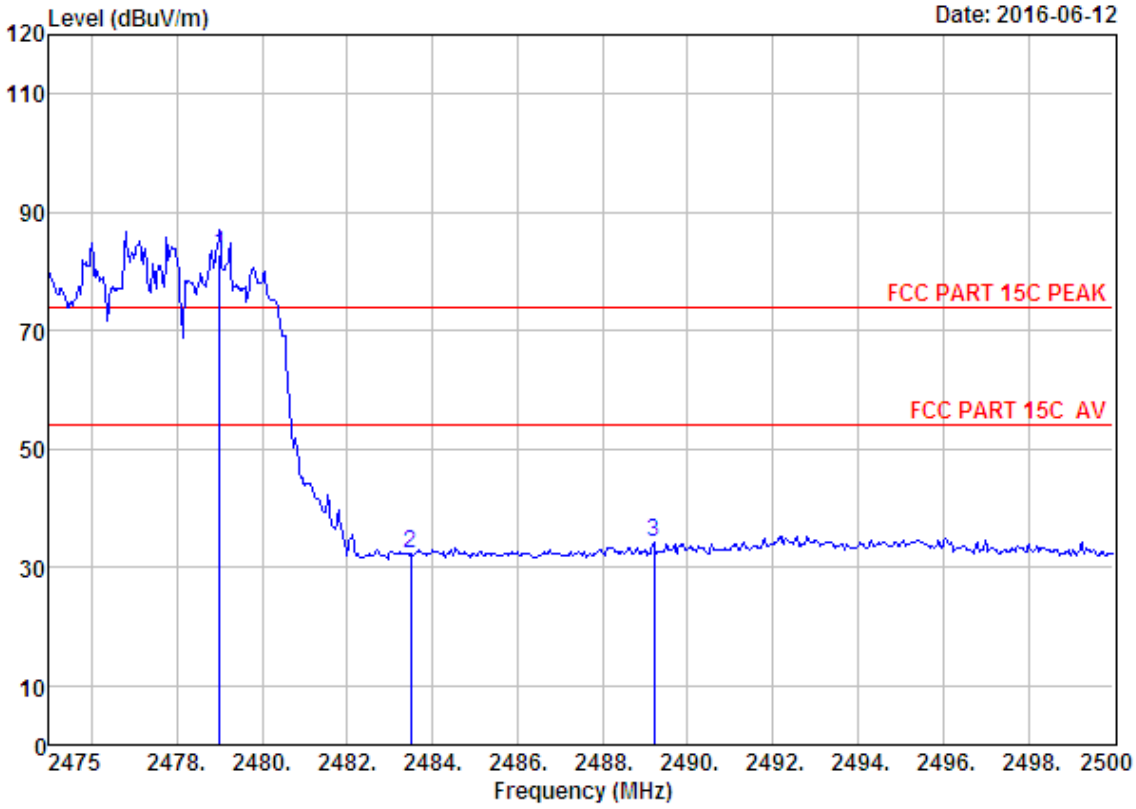
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 26
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2402MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2375.02	27.64	6.60	34.59	35.01	34.66	74.00	39.34	Peak
2	2390.00	27.64	6.62	34.62	34.00	33.64	74.00	40.36	Peak
3	2400.00	27.61	6.62	34.64	40.71	40.30	74.00	33.70	Peak
4	2405.05	27.61	6.64	34.64	83.99	83.60	74.00	-9.60	Peak

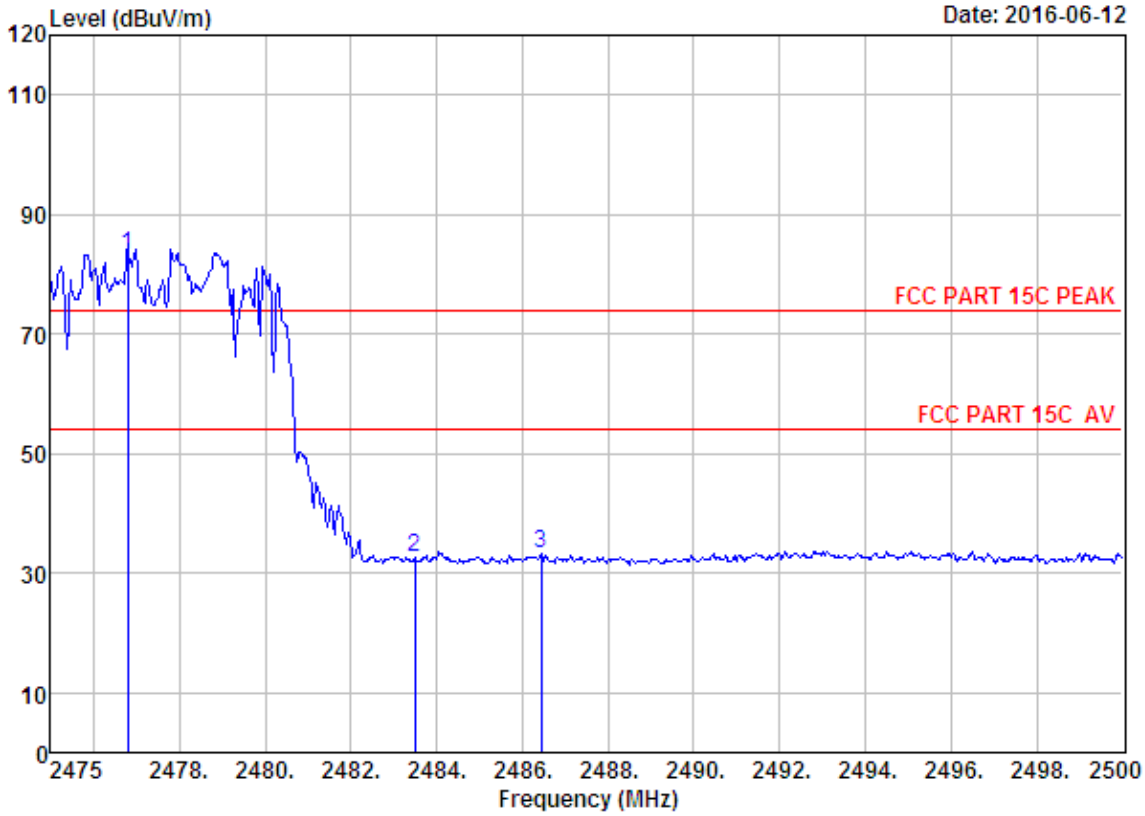
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : site Data no. : 27
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2479.00	27.58	6.71	35.11	83.81	82.99	74.00	-8.99	Peak
2	2483.50	27.58	6.71	35.11	33.14	32.32	74.00	41.68	Peak
3	2489.20	27.58	6.73	35.24	35.07	34.14	74.00	39.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



Site no. : 966 1# chamber Data no. : 28
Dis. / Ant. : 3m ANT 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15C PEAK
Env. / Ins. : Temp:23.6';Humi:56%;Press:101.52kPa
Engineer : Tony
EUT : Portable Speaker
Power : DC 3.7V
M/N : LI-S20128BT
Test Mode : (π/4)DQPSK TX 2480MHz (Hopping On)

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.80	27.58	6.71	35.11	84.09	83.27	74.00	-9.27	Peak
2	2483.50	27.58	6.71	35.11	33.49	32.67	74.00	41.33	Peak
3	2486.45	27.58	6.71	35.11	34.10	33.28	74.00	40.72	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

10. POWER LINE CONDUCTED EMISSIONS

10.1. Limit

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

10.2. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT was charged form PC's USB port which connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#).. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

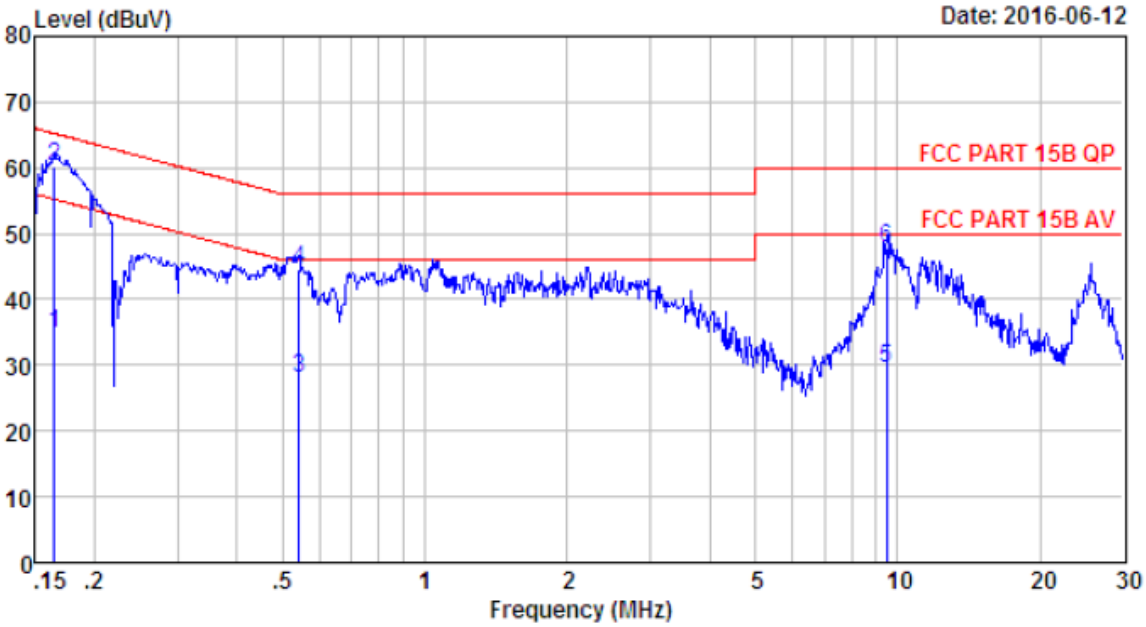
The bandwidth of test receiver (R & S ESHS30) is set at 10kHz.

The frequency range from 150kHz to 30MHz is checked.

10.3. Test Result

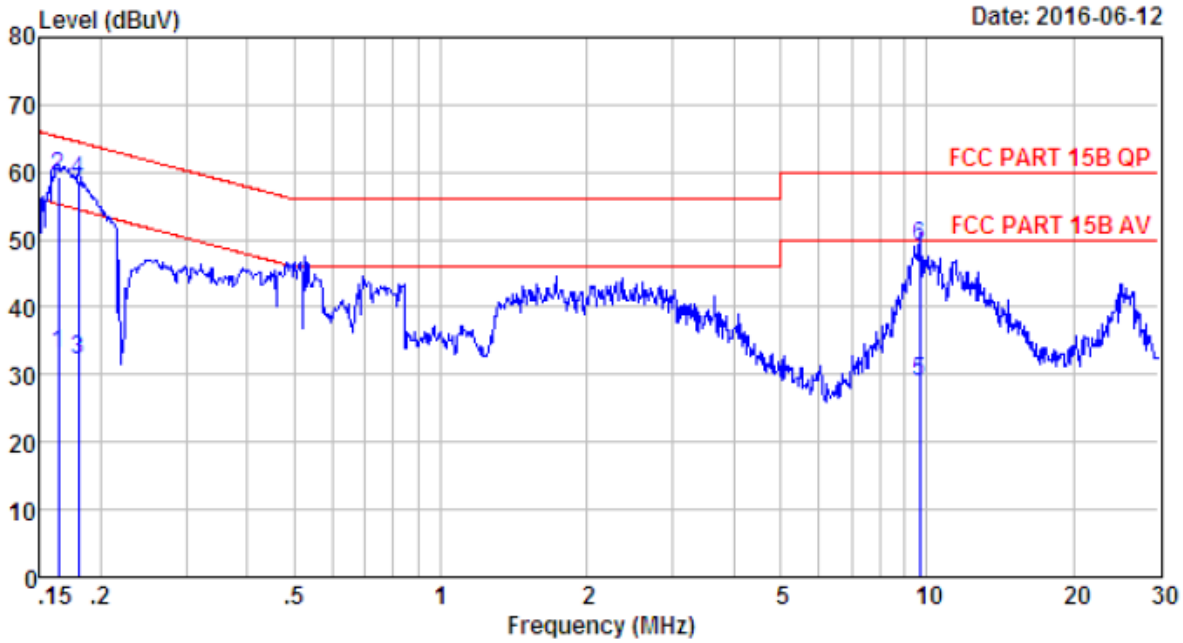
0.15MHz—30MHz Conducted emissison Test result
EUT: Portable Speaker M/N: LI-S20128BT
Power: DC 5V From PC Input AC 120V/60Hz,240V/60Hz
Test date: 2016-06-12 Test site: 3m Chamber Tested by: Tony.Tang
Test mode: Tx Mode + Charging
Note: Charging form PC and adapter, The PC test is worst case.
Pass

10.4.Test data



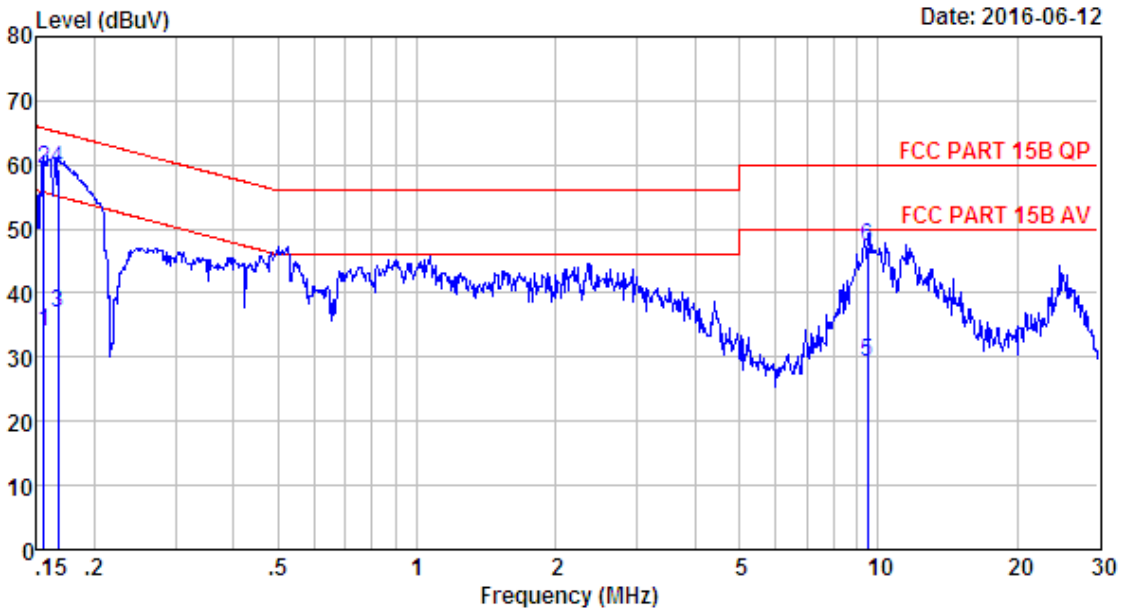
Site no : 844 Shield Room Data no. : 1
Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : NEUTRAL
Limit : FCC PART 15B QP
Engineer : Tony
EUT : Portable Speaker
Power : DC 5V From PC Input AC 120V/60Hz
M/N : LI-S20128BT
Test Mode : TX Mode+Charging

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.16	9.50	9.81	15.50	34.81	55.25	20.44	Average
2	0.16	9.50	9.81	40.98	60.29	65.25	4.96	QP
3	0.54	9.60	9.82	8.49	27.91	46.00	18.09	Average
4	0.54	9.60	9.82	25.22	44.64	56.00	11.36	QP
5	9.50	9.69	9.87	9.91	29.47	50.00	20.53	Average
6	9.50	9.69	9.87	28.19	47.75	60.00	12.25	QP



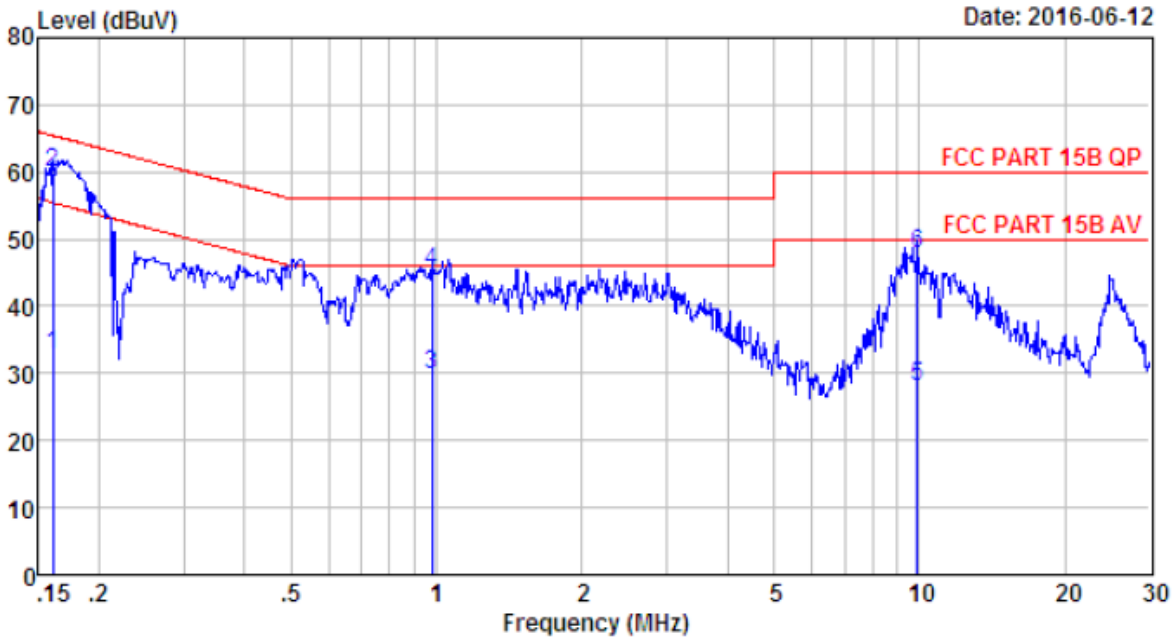
Site no : 844 Shield Room Data no. : 3
Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : LINE
Limit : FCC PART 15B QP
Engineer : Tony
EUT : Portable Speaker
Power : DC 5V From PC Input AC 120V/60Hz
M/N : LI-S20128BT
Test Mode : TX Mode+Charging

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.16	9.61	9.81	13.70	33.12	55.30	22.18	Average
2	0.16	9.61	9.81	39.79	59.21	65.30	6.09	QP
3	0.18	9.61	9.80	12.90	32.31	54.50	22.19	Average
4	0.18	9.61	9.80	39.32	58.73	64.50	5.77	QP
5	9.65	9.66	9.87	9.40	28.93	50.00	21.07	Average
6	9.65	9.66	9.87	29.55	49.08	60.00	10.92	QP



Site no : 844 Shield Room Data no. : 5
Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : LINE
Limit : FCC PART 15B QP
Engineer : Tony
EUT : Portable Speaker
Power : DC 5V From PC Input AC 240V/60Hz
M/N : LI-S20128BT
Test Mode : TX Mode+Charging

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.16	9.61	9.81	14.50	33.92	55.69	21.77	Average
2	0.16	9.61	9.81	40.05	59.47	65.69	6.22	QP
3	0.17	9.61	9.81	17.50	36.92	55.12	18.20	Average
4	0.17	9.61	9.81	40.05	59.47	65.12	5.65	QP
5	9.50	9.66	9.87	9.70	29.23	50.00	20.77	Average
6	9.50	9.66	9.87	27.84	47.37	60.00	12.63	QP



Site no : 844 Shield Room Data no. : 7
Env. / Ins. : Temp:25.3'C Humi:58% Press:101.50kPa LINE Phase : NEUTRAL
Limit : FCC PART 15B QP
Engineer : Tony
EUT : Portable Speaker
Power : DC 5V From PC Input AC 240V/60Hz
M/N : LI-S20128BT
Test Mode : TX Mode+Charging

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.16	9.49	9.81	13.50	32.80	55.43	22.63	Average
2	0.16	9.49	9.81	40.52	59.82	65.43	5.61	QP
3	0.98	9.61	9.82	10.50	29.93	46.00	16.07	Average
4	0.98	9.61	9.82	25.63	45.06	56.00	10.94	QP
5	9.91	9.70	9.89	8.39	27.98	50.00	22.02	Average
6	9.91	9.70	9.89	28.21	47.80	60.00	12.20	QP

11. ANTENNA REQUIREMENTS

11.1. Limit

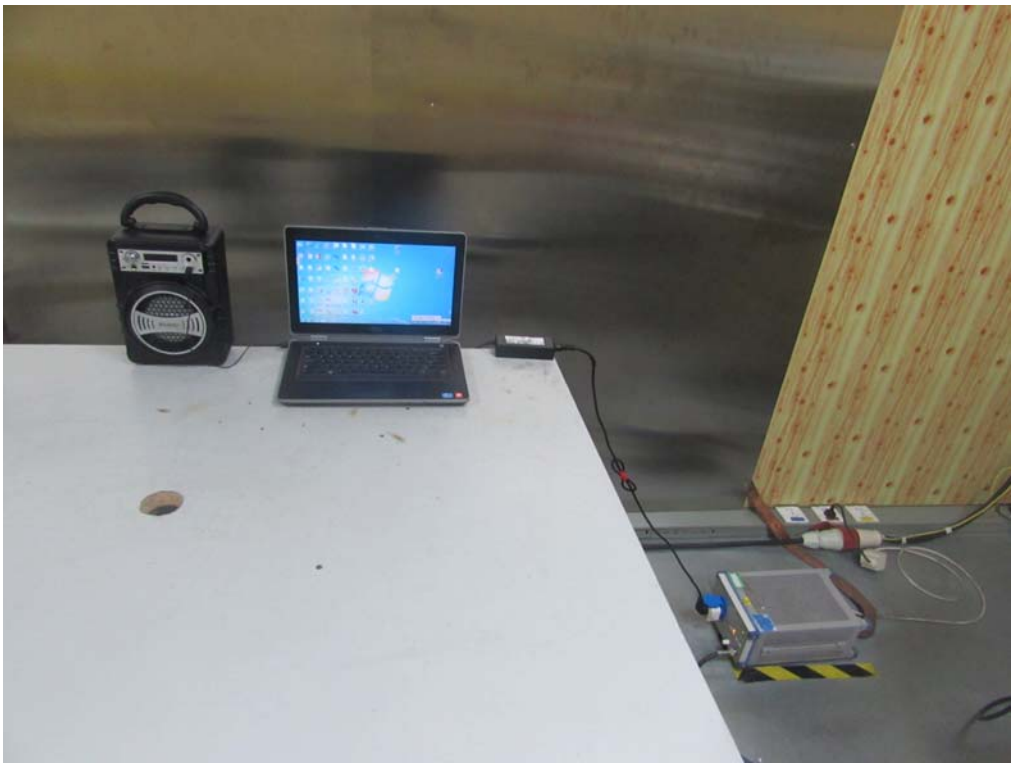
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2. Result

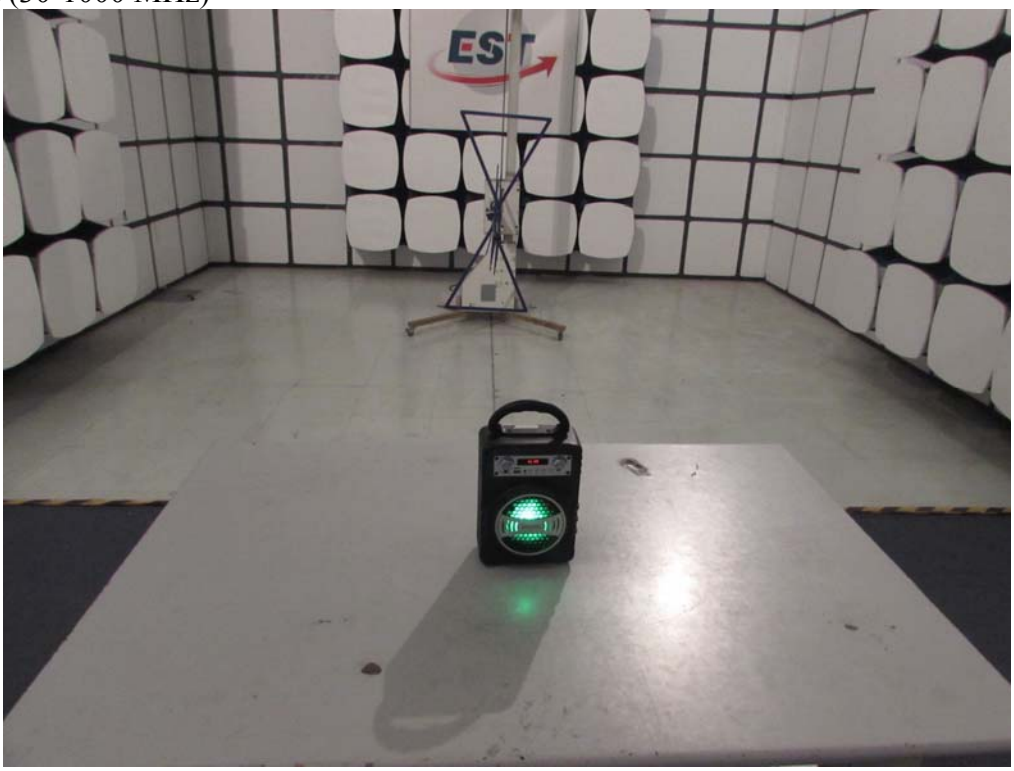
The antennas used for this product are integral Integral Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 0dBi.

12. TEST SETUP PHOTO

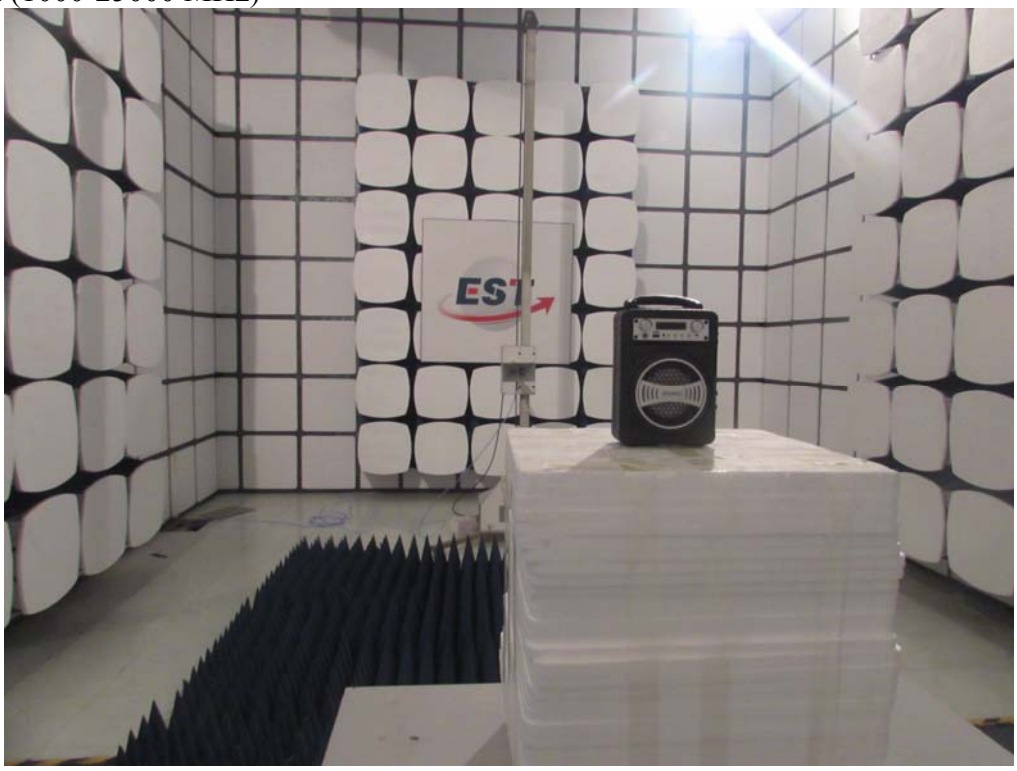
Conducted Test



Radiated Test (30-1000 MHz)



Radiated Test (1000-25000 MHz)



13. PHOTOS OF EUT

External Photos

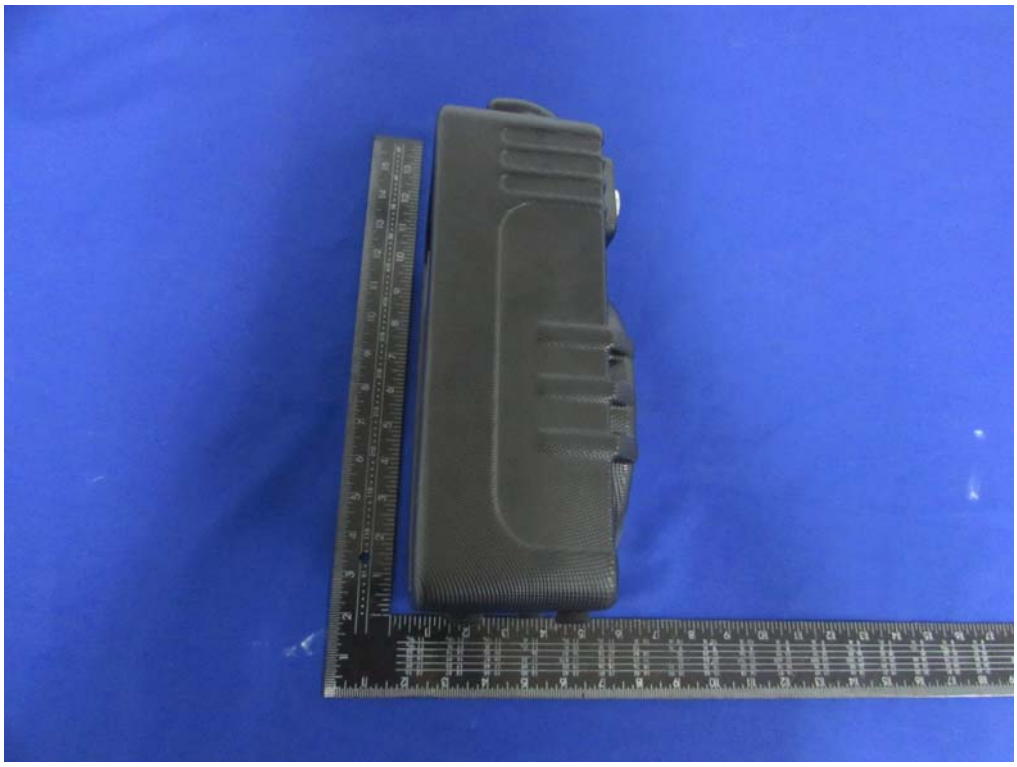
M/N: LI-S20128BT

External Photos

M/N: LI-S20128BT

External Photos

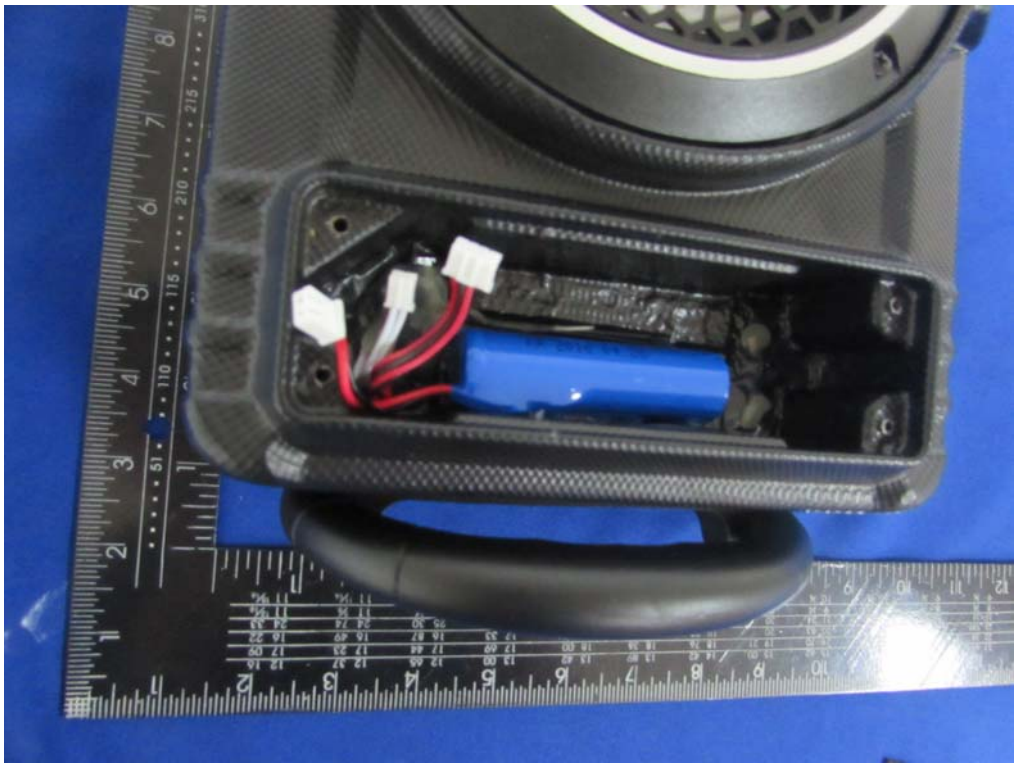
M/N: LI-S20128BT



External Photos
M/N: LI-S20128BT

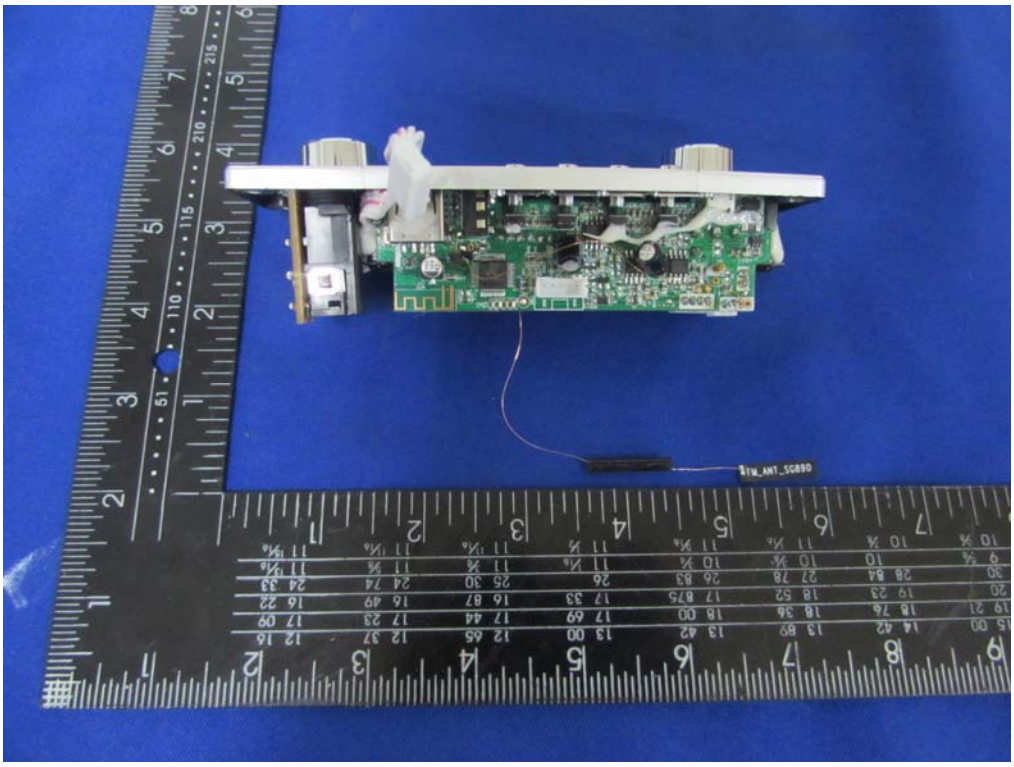
Internal Photos

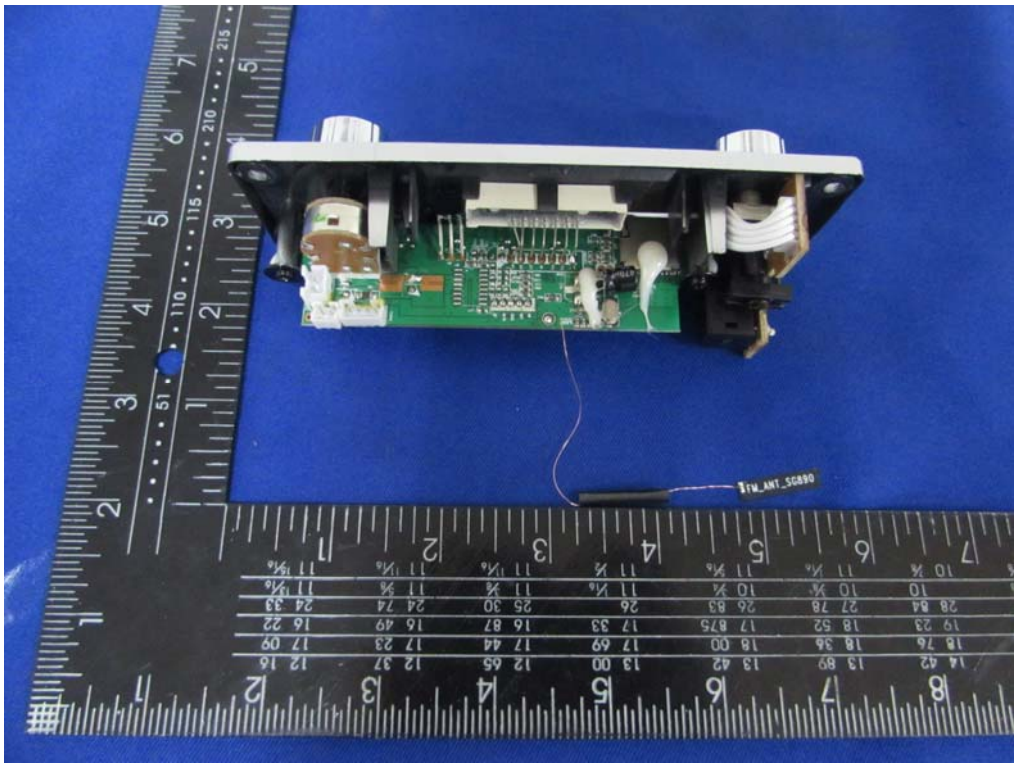
M/N: LI-S20128BT



Internal Photos

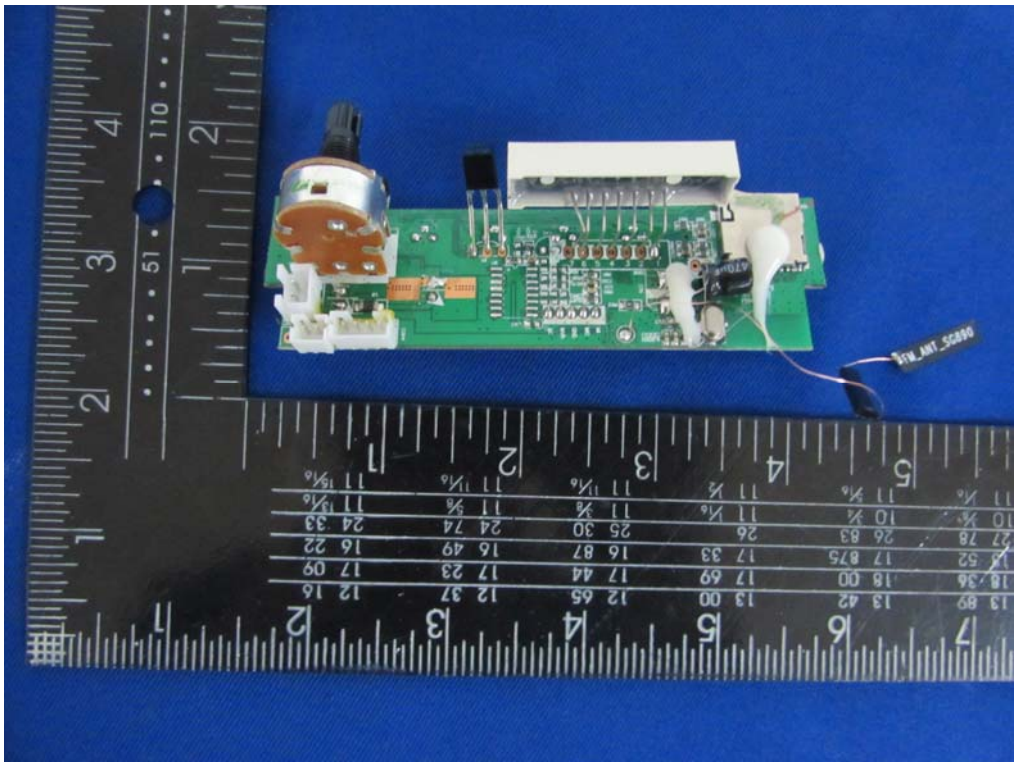
M/N: LI-S20128BT

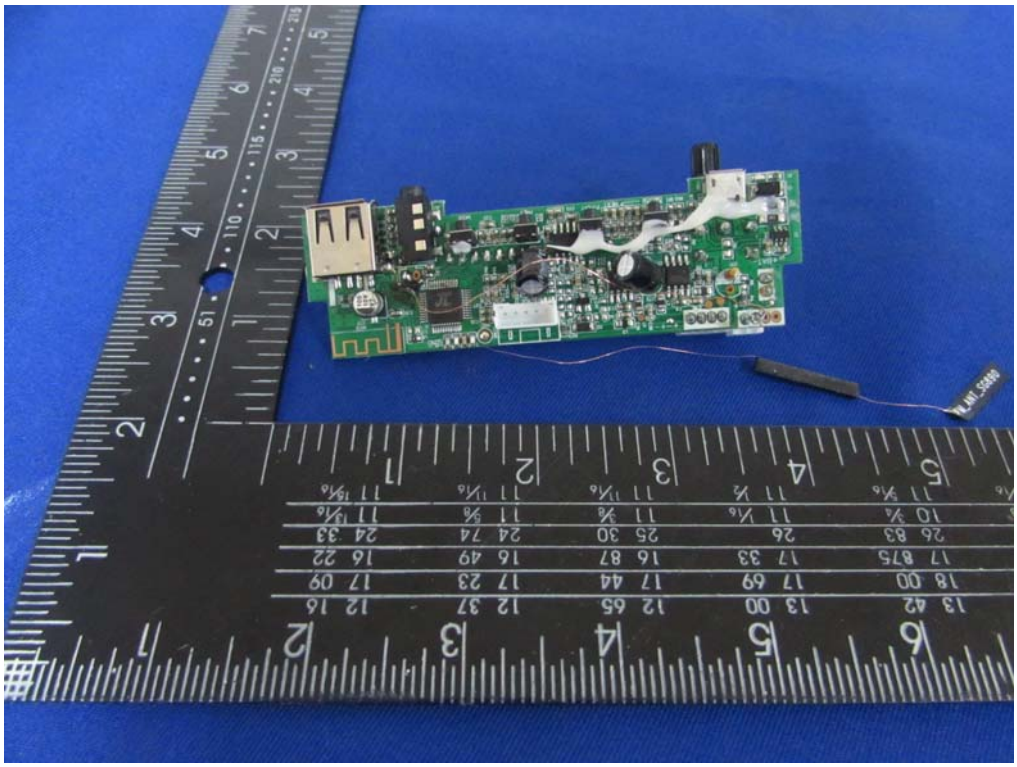




Internal Photos

M/N: LI-S20128BT





Internal Photos

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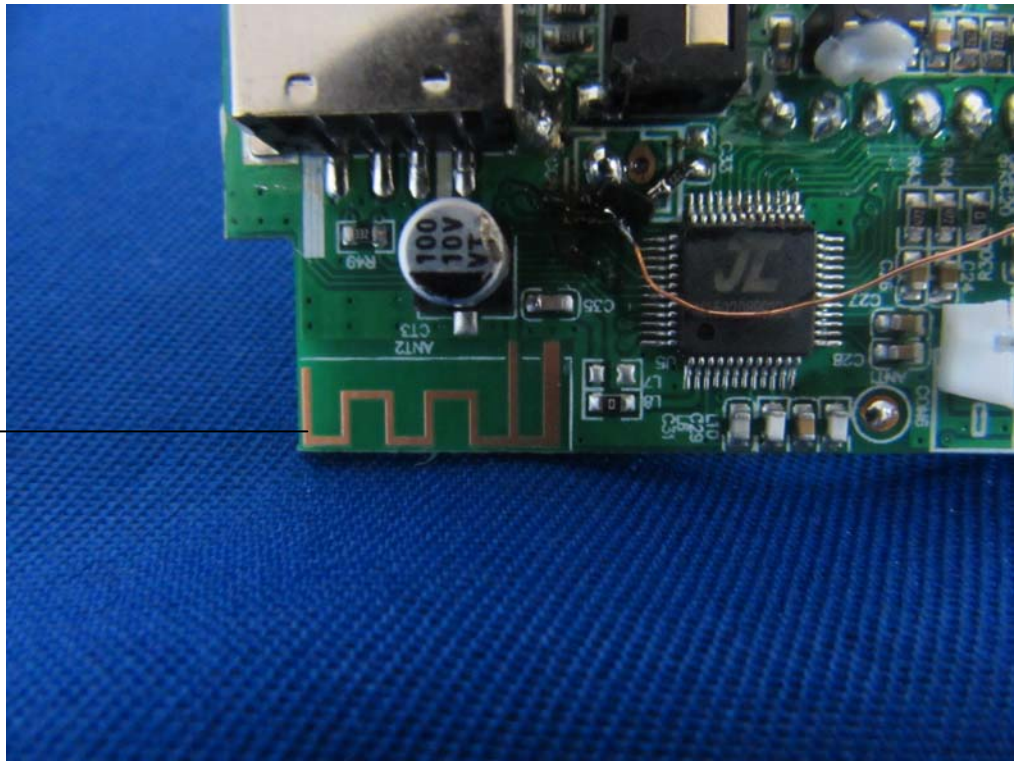
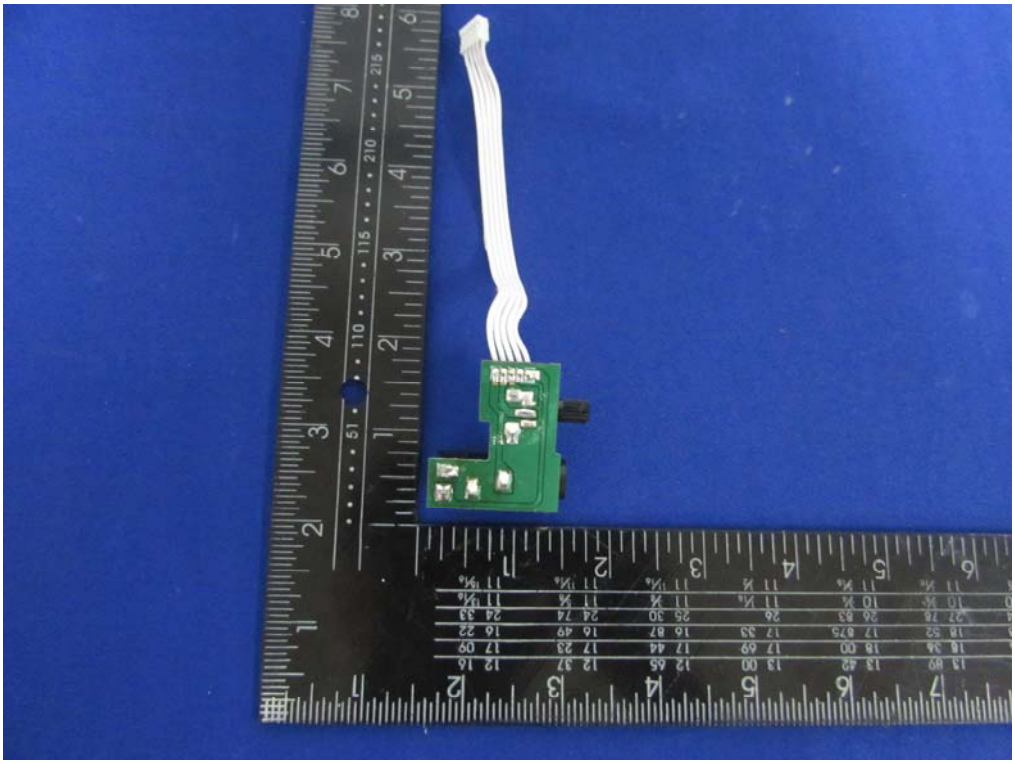
Internal Photos
M/N: LI-S20128BT